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C. E. P. BROOKS MEMORIAL ISSUE

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MALCOLM RIGBY, Editor

Vol. 10 JANUARY 1959 No. 1

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SPECIAL FEATURE IN THIS ISSUE

Bibliography of Selected Works of C. E. P. Brooks

By
Marian Rigby and Malcolm Rigby

(*For complete table of contents see back cover*)

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CHARLES ERNEST PELHAM BROOKS (1888–1957)

IN MEMORIAM

For a productive scientist such as C. E. P. Brooks, whose numerous published works stand s an enduring monument to a life well-spent in service to mankind, perhaps there could be o more appropriate memorial than a simple listing of his most important publications so that uture generations of scientists can have a better perspective of the wide range of contributions nade over a period of four decades, and also to make it easier to locate or to cite correctly hese works.

Certainly the bare statistics of a man's life cannot convey the motivating forces or the trength of character which produced such remarkable achievements. And the impact of his ublished works is not revealed in the publications themselves, but in the thousands of publica- ions by other scientists, where his works are cited, or even where his ideas have been appro- riated or extended without being credited to the rightful author (that is said to be the ultimate ompliment).

C. E. P. Brooks was born in London on November 10, 1888, received his early education t Owens School, Islington, and his later training at University College School, London, where e received the Bachelor's degree in 1907 at the age of 18, and the Doctorate in Science in 926 at the age of 38. He entered the Meteorological Office in London in 1907, and was soon ut to work by Sir Napier Shaw in the compilation of the *Réseau Mondial* volumes (*see item* 0A–196). This series presented annual summaries of the climatic elements for a uniformly istributed and stable network of stations over all of the continents and later for the major ceans. The work Brooks did on these compilations, coupled with his interest in global and istorical or geological climatology, resulted in many of his most important contributions to limatology such as his estimate of the number of thunderstorms and the number of lightning trokes taking place at any moment or in any season over the whole earth (*see* 10A–64), or he mean cloudiness of the earth (10A–87), or that monumental work **"Upper Winds over the Vorld"** which was compiled in collaboration with Messrs. Durst, Sawyer, Dewar and Miss Carruthers. Similar works on Upper Air Temperatures, Humidities, etc. over the globe had een conceived during the time when Brooks was interested in Global Climatology, and have een published by the Meteorological Office in the past year.

Apart from the *Réseau Mondial*, 1910–1934, the most outstanding contributions of C. E. P. Brooks and collaborators were:

The evolution of climate, 1922 and 1925 (10A–1)
Climate through the ages, 1926 and 1949; Russian transl. 1952 (10A–2, –8, –11)
British floods and droughts (with J. Glasspoole), 1928 (10A–4)
Climate; a handbook for business men, students and travelers, 1929, 1932 (10A–5)
Climate in everyday life, 1950 (10A–9)
Upper winds over the world, 1950 (with Carruthers et al.), (10A–10)
Handbook of statistical methods in meteorology (with Carruthers), 1953 (10A–12)
The English climate, 1954 (10A–13)
Bibliography of meteorological literature, Royal Met. Soc., 1922–1950 (10A–195)
The distribution of thunderstorms over the globe, 1925 (10A–64)
The relations of solar and meteorological phenomena, 1926/1936 (10A–76, –144)
The mean cloudiness over the earth, 1927 (10A–87)
The distribution of mean annual maxima and minima of temperature over the globe, 1928 (10A–93)

The influence of Arctic ice on the subsequent distribution of pressure over the eastern North Atlantic and Western Europe, 1928 (10A–94)
The classification of meteorological literature, 1936 (10A–142)
Climate and the deterioration of materials, 1946 (10A–160)

In his youth, Brooks showed marked aptitude for mathematics, and he was always able to visualize a problem from inception to conclusion before he even attacked the solution. He found the greatest scope for his fertile and creative imagination in the field of Paleoclimatology, and most of his early works were along these lines. His first paper: **"The Meteorological Conditions of an Ice-Sheet and their Bearing on the Desiccation of the Globe,"** published in the *Quarterly Journal* of January 1914, led to several other papers on Quaternary Climatology, and finally to the popular book **"The Evolution of Climate"** which attempted to summarize the facts known up to that time (1922) and then to his world renowned **"Climate through the Ages,"** first published in 1926 and revised in 1949. This work was the first western book on any subject connected with Meteorology or Climatology to be translated into Russian after World War II. It came out in 1952 as **"Klimaty Proshlogo,"** Moscow (*see* 10A–11).

Many small contributions on applied climatology or meteorology appeared in the literature as a result of his decades of service as a reference librarian and consultant in climatology at the Meteorological Office. These contributions are collected and organized in the book **"Climate in Everyday Life,"** published in 1950 (*see* 10A–9), and the years of practical experience in organizing climatological data or statistical analyses were gathered together and systematized in the pioneer work **"Handbook of Statistical Methods in Meteorology,"** which was published in 1953 after more than 10 years of painstaking work by Brooks assisted by Nellie Carruthers (*see* 10A–12).

Experience in the Meteorological Office Library, in the classifying of Meteorological Literature for the Royal Meteorological Society's **"Bibliography of Meteorological Literature"** which appeared from 1920 to 1950 (*see* 10A–195), and in maintaining the exhaustive subject and regional meteorological and climatological catalogues or indexes for the Meteorological Office, resulted in Brooks' effective work on the International Meteorological Organization's Commission for Bibliography and Publications. The Universal Decimal Classification breakdown for Meteorology (551.5), used by most meteorological services in the world since 1936, was elaborated by C. E. P. Brooks with the help of T. Hesselberg and Tor Bergeron. A **"Manual of Librarianship,"** the Meteorological Office's **"Meteorological Glossary,"** and many other IMO or WMO tools and projects resulted from Brooks' prodigious energy, broad perspective and remarkable foresight.

Last but not least we must express our gratitude, not only for his hundreds of hours of effective work in abstracting, reading proof, preparing special bibliographies on subjects of interest to himself, smoothing out subject-heading lists, assigning U.D.C. classification numbers to abstracts or lists of headings, and other seemingly tedious chores without which a publication such as *Meteorological Abstracts and Bibliography* would not have been possible, but also for his warm friendship as first evidenced during the 7 weeks of I.M.O. Conferences in Toronto in August and September of 1947, and during later visits (in 1949 and 1954) at his home in Ferring, Sussex, on the English Channel Coast, and during his month's visit to Washington, D. C. in August 1952, and in the hundreds of handwritten letters received during the last decade of his life. These letters and memories reveal the real simplicity, the keen intellect, the poetic and romantic fancy and the fertile imagination of the man whose selected works are listed and annotated on p. 99–130 of this issue. Not so evident, as it is anonymous, is the contribution of his wife, Dora M. Brooks, who assisted him in all of his compilations of the *Bibliography of Meteorology*, and in his work on *Meteorological Abstracts and Bibliography*, and in much of his other editorial and scientific work. Without this assistance, C. E. P. Brooks could not have accomplished in a mere 40 years what most men would have taken a century to do.

MALCOLM RIGBY

FOREWORD

Meteorological Abstracts and Bibliography is a monthly publication whose purpose is to ring to the attention of meteorologists current literature in their field.

Part I contains abstracts of current literature in the fields of meteorology, etc.

Part II of each issue comprises an annotated bibliography of important references on a pecial subject (usually arranged chronologically).

Bibliographies published in the successive issues were:

Vol. I, 1950

Atmos. Pollution	2. Aerobiology	3. Cloud Physics	4. Hail
Tornadoes	6. Volcanic Dust	7. Climat. Changes	8. Thunderstorms
Icing	10. Acoust. Propagation	11. Evaporation	

Vol. II, 1951

Extended Forecast.	2. Long Range Forecast.	3. Soil Temp.	4. Constants, etc.
Clim. of Near East	6. Clim. of Middle East	7. Special Winds	8. Radar Storm Detect.
Condensation Trails	10. Clim. of N.E. Africa	11. Mountain Met.	

Vol. III, 1952

Clim. of N.W. Africa	2. Carbon Dioxide	3. Clim. of Argentina, etc.	4. Dew
Objective Forecast.	6. Stratus Forecast.	7. Urban Climatology	8. Clim. of C. Africa
Visibility	10. Glaze and Rime	11. Free Air Turbulence	

Vol. IV, 1953

Turbulence Theory	2. Turbulent Diffusion	3. Frost	4. Clim. of Australia, etc.
High Level Winds	6. Winds in Stratosphere	7. Jet Stream	8. Radiation Bioclim.
Clim. of Pacific	10. Auroras	11. Sferics	

Vol. V, 1954

Oceanog. Met.	2. Clim. of S.E. Asia	3. Auroral Physics	4. Tropopause
Balloons	6. Numerical Forecast.	7. Radiation Data	8. Vertical Motion
Clim. of Arctic	10. Industrial Met.	11. Wind Waves and Swell	

Vol. VI, 1955

Bibliog. of Bibliog.	2. Texts & Monogr. Bibliogs.	3. Storm Surges	
Ionospheric Prop.	5. Photochem.—Upper Atmos.	6. Cloud Physics	
Radar Cloud Physics	8–9. Atmos. Nuclei	10. Weather Modification	11. Cooling Power

Vol. VII, 1956

Synoptic Met.-Arctic	2. Clim. of Enclosed Spaces	3. Cosmic Rays (–1952)
Cosmic Rays (1953–56)	5. Atmos. Radioactivity	6. Inversions
Snow Micromet.	8. Snow Micromet. (Suppl.)	9–11. Tropical Cyclones

Vol. VIII, 1957

Solar Weather Relations	2. Night Airglow	3. Forecasting Special Elements	
Forest Micrometeorology	5. Hydromet. Forecasting	6. Numerical Forecasting (Suppl.)	
Albedo	8. Meteors	9–10. Tropospheric Propagation	11. Medical Meteorology

Vol. IX, 1958

Radioastronomy	2. Solar Astrophysics	3. Radioactivity in Atmosphere	
Waves and Currents	5. Physical Oceanog.	6. Dynamic & Phys. Oceanog.	
Long Range Forecasting	8. Radar Met.	9. Cosmic Rays	10–11. Geomagnetism

Vol. X, 1959

Works of C. E. P. Brooks	2. Tornado forecasting	3. Soil Moisture

Other bibliographies in preparation are:

Actinometers	*Micrometeorology*	*Singularities*
Frost	*Ozone*	*Synoptic Aerology*
High Atmosphere Temperatures	*Radiation*	*Thunderstorms*

Part III contains a listing of reviews, translations, reprints, and the contents of important blications. These are published in the earliest issue where space permits.

Part IV is made up of author, subject and geographical indexes. The December issue mprises cumulative author, subject, geographical and journal indexes.

EXPLANATIONS

Location of material: For each entry, a symbol is given for at least one library where the material may be found. The Union List of Serials (Gregory) is the source of most of the symbols used. In some cases, where no symbol has been assigned to a library, one will be devised according to the principles of the Union List.

Library symbols used frequently may be found in the following list:

DA:	U. S. Dept. of Agriculture Library, Washington, D. C.
DBS:	U. S. Bureau of Standards Library, Washington, D. C.
DGS:	U. S. Geological Survey Library, Washington, D. C.
DLC:	Library of Congress, Washington, D. C.
DN-HO:	U. S. Navy Hydrographic Office Library, Suitland, Md.
DNLM:	U. S. National Library of Medicine, Washington, D. C.
DWB:	U. S. Weather Bureau Library, Washington, D. C.
GB-MO:	Great Britain, Meteorological Office Library, Harrow, England.

Other symbols:

*	before an entry indicates a good data source.
†	before an entry indicates a good bibliography.
§	before an entry indicates a synoptic case history study accompanied by charts.

Geographic locations are in the English form rather than the form used locally, for example, Moscow for Moskva.

Titles of articles or monographs are in the language of the original article unless otherwise stated. Slavic (Cyrillic) titles are transliterated into the Roman alphabet according to the Library of Congress transliteration scheme.

Abbreviations:

Titles of periodicals are not abbreviated, as a rule.

The months of the year from March to July are not abbreviated. Other months are abbreviated as Jan., Feb., Aug., Sept., Oct., Nov., and Dec.

The word or abbreviation for Volume (Tom, Band, Jahrgang, Año, etc.), for Number (Heft, Fascicule, Vypusk, etc.) and for page or pages is omitted from most entries. Thus an entry will read as follows:

Meteorologische Rundschau, 2(5/6):146–151, May/June 1950.

This indicates that the article appeared in *Meteorologische Rundschau, Jahrgang* 2 (Vol 2), *Heft* 5/6 (No. 5/6), *pages* 146–151, May/June 1950.

PART 1. ABSTRACTS OF CURRENT METEOROLOGICAL MATERIAL

MAJOR GENERAL WORKS

COLLECTED WORKS

10.1–1 551.594.5(08)

Chicago Univ. Yerkes Observatory, Williams Bay, Wisc., **Symposium on auroral observations during the International Geophysical Year held at Yerkes Observatory, Sept. 11–26, 1956.** Contract AF 19(122)-480, Technical Report, No. 22, **1956.** 46 p. tables, refs. "Summary of most of the papers given at the symposium." Contents: Chamberlain, J. W., **Introduction,** p. 2. Gartlein, C. W., **Visual observation of the aurora in the Antarctic,** p. 3. Ohmhold, A., **Radio observations of aurorae,** p. 6. Glasgal, R., **Morphology of aurorae,** p. 12. Hale, D. P., **A survey of the airglow spectra,** p. 15. Landolt, A. U., **The auroral spectrum,** p. 25. Malville, M., **Solar corpuscules and the aurora,** p. 30. Schoeck, P. A., **Molecular temperatures,** p. 41. Fan. C. Y., **Laboratory studies of auroral excitation,** p. 42. **DWB**—A symposium was held at Yerkes Observatory on Sept. 17–26, 1956 to review the observational aspects for IGY auroral observers going to the Antarctic during IGY. These observers and members of the Auroral Project at Yerkes participated in the discussion and contributed papers on visual radio and photographic observations of the aurora and on auroral structure and physics. *Subject Headings:* **1. Auroral symposia 2. Antarctic auroral observation 3. Auroral spectra. I. Chamberlain, Joseph W.** (*ed.*) **II. Peach, Vidya** (*ed.*).—*M.R.*

10.1–2 550.3(08)

Washington Conference on Theoretical Geophysics, Feb. 1–3, 1956, **Proceedings.** *Journal of Geophysical Research,* Washington, D. C., 61(2, Pt. 2):317–414, June **1956.** figs., tables, refs. **DLC**—A large number of papers or abstracts of papers presented at the Conference on Theoretical Geophysics held at the National Science Foundation in Washington, D. C., on Feb. 1–3, 1956, sponsored by the NSF and Carnegie Institution of Washington and arranged by JOHN VON NEUMANN, E. H. VESTINE, L. V. BERKNER, J. KAPLAN, J. G. CHARNEY and others, with 100 participants working in theoretical meteorological hydrology, oceanography, seismology, ionospheric and cosmic ray physics, atmospheric electricity, geomagnetism, origin of earth, etc. Papers cover these and other related subjects. *Subject Headings:* **1. Theoretical geophysics conferences. I. National Science Foundation II. Carnegie Institution of Washington.**—*M.R.*

10.1–3 550.3(02)

†**Handbook of geophysics for Air Force designers,** ed. by C. F. Campen, Jr. et al. Wash., D. C., Geophysics Research Directorate, Air Force Cambridge Research Center, Air Research and Development Command, U. S. Air Force, **1957.** 1st ed. 22 chapters, each separately paged. figs., tables, bibliogs., eqs. All articles abstracted separately. **DWB**—Over 50 authors have contributed to this remarkable and voluminous handbook for Air Force designers or engineers using geophysical data as it relates to the environment in which aircraft, rockets and missiles operate. Many areas of geophysics have been omitted for want of sufficient data. Furthermore it is not intended that the data should be used in elaborate testing. The book is composed of 21 chapters, each of which has 3 to 14 sub-chapters. The major headings are: 1) Model atmospheres, 2) Temperature, 3) Atmospheric pressure, 4) Atmospheric density, 5) Wind, 6) Precipitation, 7) Clouds, 8) Atmospheric composition, 9) Atmospheric electricity, 10) Geomagnetism, 11) Meteors, 12) Terrestrial surface parameters (soil, snow, ice, oceans, earthquakes, permafrost, geodesy), 13) Tropospheric propagation, 14) Visibility, 15) Ionosphere, 16) Thermal radiation, 17) The sun, 18) Cosmic radiation, 19) Jet condensation

trails, 20) Sounding devices (rockets, meteorological instruments, balloon systems), and 21) Acoustic propagation. Extensive bibliographies accompany some of the chapters; numerous tables, graphs, photographs, nomograms, frequency distributions and a subject index with 223 major headings and about 1,000 sub-headings are included. Maps show the distribution of such factors as wind chill; January and July design temperatures; geomagnetic factors; thunderstorm frequency (monthly, seasonal and annual); sea-level, 700, 500, 300, 200, 100 and 50 mb-flow patterns over the Northern Hemisphere; earthquakes in 1955; auroral frequencies; wind speeds; etc. For listing of contents, *see* Pt. III, p. 1460, Nov. 1958, *MAB*. *Subject Headings:* **1. Handbook of Geophysics 2. Upper atmosphere data 3. Design data handbooks. I. Cole, A. E.** (*ed.*) **II. Condron, T. P.** (*ed.*) **III. Ripley, W. S.** (*ed.*) **IV. Sissenwine, Norman** (*ed.*) **V. Solomon, Irving** (*ed.*).—*M.R.*

10.1–4 551.513:92(08)

Festskrift tillägnad Vilhelm Bjerknes, den 14 Mars 1942. [Anniversary volume in honor of Vilhelm Bjerknes, March 14, 1942.] Stockholm, Centraltryckeriet, **1942.** 145 p. photos., refs. 8 articles in Swedish, German, English, Danish. Some summaries in English. All articles abstracted separately. **DWB**—This volume, dedicated to V. BJERKNES in honor of his 80th birthday, contains 8 first class scientific papers by leading colleagues or students of BJERKNES (ANDERS ÅNGSTRÖM, TOR BERGERON, HELGE PETERSEN, E. PALMÉN and A. NYBERG, V. W. EKMAN, H. W: SON AHLMANN and others), and with the names of several hundred friends, former students and institutions in Sweden, Finland, Denmark and Iceland. The leading article by BERGERON is on the importance of the Bjerknes circulation theorem in physics and geophysics. Other articles are concerned with glacial ablation, synoptic-aerological studies, climatic variations, wind and inertia currents, etc. Only a limited number (550 copies) of this *festschrift* were issued, and since it was in wartime, not much publicity was given to the work. *Subject Headings:* **1. Biography of V. Bjerknes 2. Bjerknes anniversary volume 3. Bjerknes circulation theorem.**—*M.R.*

10.1–5 551.509.312(08)

†California. Univ. at L. A. Dept. of Meteorology, **Large-scale synoptic processes.** Contract AF 19(604)-1286, Final Report, June 30, **1957.** each article repaged. figs. (some fold.), tables, bibliogs., eqs. Includes its *Scientific Reports*, No. 1–6. Articles abstracted separately. **DWB**—This mammoth report contains 11 articles giving results of work on large scale synoptic processes conducted at U.C.L.A. during 1955 and 1956 under contract with the U. S. Air Force and U. S. W. B., and written by J. BJERKNES, E. N. LORENZ, YALE MINTZ, J. B. KNOX, ARNT ELIASSEN and PHILIP F. CLAPP. The subject matter ranges from the circulation during July–Aug. 1949, to Hovmöller diagram analysis, winter tropical circulation model, summer meridional heat flux, summer kinetic energy of atmosphere, long range forecasting models for numerical prediction, etc. *Subject Headings:* **1. Large scale weather processes 2. Atmospheric circulation. I. Bjerknes, Jacob.**—*M.R.*

10.1–6 551.585.5:061.3

†United Nations Educational, Scientific and Cultural Organization, **Climatology: reviews of research.** Its *Arid Zone Research*, No. 10, **1958.** 190 p. figs., tables, bibliog. at end of each section. Price: $5.00; 1,500 fr. **DWB, DLC. Review** in *Journal of Scientific and Industrial Research*, Sec. A, 17(3):137, March **1958.**—This publication contains 8 reviews of progress in various fields of arid-zone climatology, prepared for a UNESCO symposium at Canberra (1956). A subject index is included. (For listing of contents, *see* Pt. III, p. 920, July 1958, *MAB*; each paper is being abstracted separately.) *Subject Headings:* **1. Arid zone climatology symposia 2. Progress in arid zone climatology.**—*G.T.*

TEXTBOOKS

10.1–7 551.579(02) 628.13(02)

†*Bulakh, Vladimir Leont'evich; Solomentsev, N. A. and Chekmarev, V. A., **Osnovy gidrologii i sel'skokhoziaĭstvennykh melioratsiĭ.** [Basic hydrology and agricultural conservation.] Leningrad, Gidrometizdat., **1955.** 311 p. 116 figs., 22 tables, 25 refs., 80 eqs

DLC (GB6661.B8)—This textbook—(3000 copies) for students and technicians in agriculture, rrigation and conservation work—consists of 20 chapters divided into 3 major parts: I) Basic ydrology, II) Basic hydrometry and III) Basic agricultural conservation. The individual hapters cover: 1) history, problems and development of hydrology, 2) water cycle, 3) ground vater, 4) lakes, 5) bogs, 6) glaciers, 7) rivers, 8) problems of hydrometry, 9) water level, 0) deep water (profiles etc.), 11) current velocity measurement, 12) runoff, 13) hydrographs nd their construction, 14) sediment transport, 15) problems of melioration, 16) irrigation, 7) water conservation, 18) drainage, 19) field practices and 20) shelter belts and other vegeta- ive erosion, sand and snow control measures. The book contains numerous illustrations, ketches, some theory and nomograms and tables for calculation, etc. *Subject Headings:* **. Hydrology 2. Hydrometry textbooks 3. Water conservation textbooks.**—*M.R.*

10.1–8 551.521.18(02)

†Smith, R. A. (*Radar Research Estab., Malvern*); Jones, F. E. (*Royal Aircraft Estab., Farnborough*) and Chasmar, R. P. (*Metropolitan Vickers Elect. Co.*). **Detection and measure- ient of infra-red radiation.** Oxford, Clarendon Press, **1957.** 458 p. numerous figs., tables, efs., eqs. **DWB** (M21.61 S658de)—A complete technical coverage of all aspects of infrared adiation, its nature, detection and applications, except for infrared spectroscopy which is reated in other texts. The 13 chapters cover: (1) the general subject of infrared radiation; 2) emission and absorption; (3) thermal detectors (radiation thermo-couple, bolometer, and Golay cell); (4) photo detectors of infrared radiation; (5) limitation of accuracy due to random luctuations; (6) fluctuations in amplifiers and indicators; (7) ultimate sensitivity of detectors; 8) sources of infrared radiation; (9) infrared optical materials; (10) filters and gratings, etc.; 11) spectrometers; (12) amplifiers; and (13) atmospheric transmission of infrared radiation. The last chapter (p. 436–448) reviews historical and recent work on atmospheric transmission nd absorption of infrared solar radiation by various constituents of the atmosphere. The ork of S. P. Langley (1880–1900) who invented the bolometer and of A. Add (1938–date) n deuterium (HDO) and other constituents of the atmosphere, is emphasized. *Subject Headings:* **1. Infrared measurement techniques 2. Atmospheric transmission of infrared . Infrared radiation instruments 4. Infrared radiation textbooks.**—*M.R.*

10.1–9 551.510.42:551.574.1:61(02)

†Green, H. L. and Lane, W. R., (*Chem. Defence Exp. Est., Porton, Eng.*), **Particulate louds: dusts, smokes and mists: their physics and physical chemistry and industrial and nvironmental aspects.** Princeton, N. Jersey, Van Nostrand, **1957.** 425 p. 108 figs., plates, refs. at end of each ch. **DWB** (M8 G9766pa). Review in *Science Progress*, London, 6(182):373–374, April **1958.**—The physics and physical chemistry of particulate clouds s unified systems are treated in Pt. I under the following chapter heads: 1) Introduction dust, smokes and mists—nature and properties of particles); 2) Production of particulate louds; 3) Physical characteristics; 4) Optical properties; 5) Coagulation; 6) Deposition and nfiltration; 7) Sampling and estimation; 8) Diffusion in the atmosphere. Pt. II covers ndustrial and environmental aspects: 9) Collection; 10) Health hazards; 11) Atmospheric ollution; 12) Aerosols in nature (cloud, fog, mist and haze) and 13) Uses of particulate clouds n industry, medicine, agriculture, pest control, screening and signalling. A list of >200 ournals from which the hundreds of references have been taken is included, and author and etailed subject indexes are appended. *Subject Headings:* **1. Particulate clouds 2. Aerosols . Atmospheric pollution.**—*M.R.*

10.1–10 551.508.85

Khakhalin, Viktor Stepanovich, **Radiotekhnika v aerologii.** [Radio engineering in erology.] Leningrad, Gidrometizdat, **1957.** 263 p. 100 figs., 13 tables, eqs. **DWB** MO8 K45ra)—A technical book (3800 copies) with detailed diagrams and charts for use in eaching and practice in the hydrometeorological service. The basic physical and techno- gical principles of the equipment and propagation are first covered in detail. Ionospheric ropagation and modulation are taken up in Ch. 3, electronic and ionic equipment of all types Ch. 4, amplifiers in Ch. 5, radio transmitters of radiosondes and other aerological equipment Ch. 6, and other aspects in the succeeding 7 chapters (power sources, radio location, thunder-

storm cloud and shower location and observations of other meteorological elements). Radar and cm wave propagation are considered. *Subject Headings:* **1. Radio meteorology 2. Radar meteorology 3. Radioelectric aerological equipment 4. Textbooks.**—*M.R.*

10.1–11 533.6(02)

Scorer, R. S. (*Imperial College, London*), **Natural aerodynamics.** N. Y., Pergamon Press, **1958.** 312 p. figs., 22 plates, eqs., ref., p. 307. (*International Series of Monographs on Aeronautical Science and Space Flight,* Div. 2, Aerodynamics, Vol. 1.) **DLC** (QC880.S38)—A unique text which grew out of a series of lecture notes for extramural courses in the Dept. of Meteorology at Imperial College, intended for aviators, engineers, geographers, meteorologists, etc. The treatment is moderately mathematical but not to the extent that the mathematics overbalances the empirical, descriptive or illustrative material in any chapter. The 11 chapters cover: 1) inertia forces; 2) motion on a rotating earth; 3) vorticity; 4) viscosity; 5) boundary layers; 6) wakes and turbulence; 7) convection and thermals; 8) plumes and jets; 9) air waves (explosion, tidal, mountain waves, etc.); 10) clouds and fallout; 11) philosophy of method (the mathematicians, the physicists and the geographers method and dimensional analysis). Schematic diagrams are included to illustrate every process or concept. *Subject Headings:* **1. Natural aerodynamics textbooks 2. Convection 3. Turbulence 4. Fallout from clouds.**—*M.R.*

10.1–12 523.8 523.03(02)

†*Dufay, Jean, **Nébuleuses galactiques et matière interstellaire.** [Galactic nebulae and interstellar matter.] Paris, Albin Michel, **1954.** 492 p. 51 figs., 24 plates, 14 tables, 440 refs., eqs. (Sciences d'Aujourd'hui.) **DLC** (QB855.D77). Also trans. into English by A. J. Pomerans. N. Y., Philosophical Library, **1957.** "Revisions of certain sections." 352 p. 51 figs., 24 plates, 14 tables, 462 refs., eqs. **DLC** (QB855.D7713)—Fundamentals of astrophysics are treated in the Introduction; Atoms and molecules in space in Pt. I; Solid particles in space in Pt. II; Clouds of gas or particles and concentration into stars as Pt. III; and Diffuse matter outside the Milky Way as Pt. IV. Techniques of observation such as spectroscopy, electron optics, etc., and concepts of modern physics such as quantum theory of radiation and the optics of small particles, etc. are treated in due place. Half of the matter in the Galaxy is said to be in the form of rare gases and fine dust—most of the discoveries in this field have been made in the last 30 yrs. Radio astronomy, emissions of hydrogen atoms in space, and the dynamics of interstellar space are also treated. Excellent photographs of nebulae and of various portions of the Galaxy made at the Haute-Provence Observatory are included. The English edition is revised to bring it up from 1953 to 1955, and 22 refs. added to the bibliography covering 1953–1954 literature. Night sky emissions are covered in Ch. 11 (on the general scattering of light in the milky way). *Subject Headings:* **1. Galactic nebulae 2. Interstellar matter 3. Astrophysics textbooks.**—*M.R.*

MONOGRAPHS AND COMPREHENSIVE PAPERS

See also: **Wilson cloud chamber** (Gentner et al.), 10.1–38; **Physical oceanog. reviews** (Charnock), 10.1–74; **Hydrographic research, Baltic** (Schulz), 10.1–76; **Cloud seeding with salt and with water, French Equatorial Africa** (du Chaxel), 10.1–184; **Minimum temps., Florida** (Johnson), 10.1–252; **Climate, Belgian Congo, So. Central Africa** (Vandenplas), 10.1–313.

10.1–13 551.584.1:63(02)

†Brooks, F. A., **An introduction to physical microclimatology, Chapters I, II, III.** Davis Campus, Univ. of California, **1957.** 105 p. figs., tables, 135 refs., eqs. **DWB** (M84.1 B873in)—The author presents in a thoroughly technical manner the numerous aspects of microclimate for use in agricultural and industrial engineering research or practice. Emphasis is on heat and vapor transfer calculations. The present monograph comprises the first 3 chapters of a projected 7-chapter work comparable in scope to that of GEIGER's or SAPOZHNIKOVA's famous texts, but from an entirely different approach. Ch. I) covers general aspects of climate and weather on a broad scale; Ch. II), solar atmospheric and terrestrial radiation;

Ch. III), conduction of heat in the ground. Numerous references are given by chapters. Charts and graphs, tables and nomograms provide basis for calculation of elements of microlimate, or of effect of microclimate on operations (e.g., evapotranspiration, frost, solar heating, lbedo, irradiation on a slope). Applications are mainly to the U. S. and especially the Southvest or California. *Subject Headings:* **1. Microclimatology textbooks 2. Agricultural climaology.**—*M.R.*

10.1–14 551.584:551.501.7:551.508.82

†Deviatova, Valentina Aleksandrovna, **Mikroaerologicheskie issledovaniia nizhnego ilometrovogo sloia atmosfery.** [Microaerological research of the lower kilometer of the tmosphere.] Leningrad, Gidrometeoizdat, **1957.** 143 p. 49 figs., 24 tables+14 tables in ppendix, 44 refs., eqs. **DLC** (QC880.D48), **DWB**—A monograph covering several aspects f the micrometeorology of the lower 1000 m of the atmosphere: diurnal variations in temp., ind speed and humidity during the various seasons; and turbulence, lapse rates, etc., based n data from 50 series of soundings (562 actual ascents) to 500–1000 m during 1950–54 at the Central Aerological Observatory. Every month of the year is represented by 1–7 series of oundings, each series comprising an ascent every 3 hrs or in some cases every hour. An M-Ts AO meteorograph was used in an MAZ (Morskoĭ aerostat zagrazhdeniia) aerostat. The 5 chapters of the monograph cover: 1) present status of knowledge of the lower kilometer f the atmosphere, temp., lapse rate (inversions), humidity (and humidity gradient), wind and wind profiles); 2) methods of research with aerostat, characteristics of the aerostat eteorograph, influence of solar radiation on the bimetallic temp. elements, calibration, omparison of results from radiosonde, airplane and aerostat meteorographs, etc.; 3) temerature regime—diurnal, seasonal and vertical gradient variations, inversions, (p. 65–86) nd their spectral, temporal and synoptic characteristics; 4) humidity regime—diurnal variaions, vertical gradient and variations in various seasons (specific humidity or mixing ratio);) wind regime—diurnal cycle, vertical profile, turbulence characteristics related to height, eason, temp. gradient and wind. The entire work is well supported by data in the form of nalytical tables, graphs, charts, etc. *Subject Headings:* **1. Microaerological analysis of owest kilometer 2. Inversions over Moscow 3. Turbulence regime 4. Aerometeorographs . Aerostat soundings 6. Moscow, U.S.S.R.**—*M.R.*

10.1–15 551.508.27

*Utaaker, Kare, **Studies in local and micro-meteorology at Kleppe, Pt. 1, Investigations n the air temperature observed in various types of thermometer screens.** *Bergen, Norway. Iniversitetet. Arbok*, 1956, *Naturvitenskapelig Rekke*, No. 4, issued **1956.** 39 p. 10 figs., tables, 4 refs. **DLC**—Several types of large and small thermometer shelters were compared uring June–Sept. 1952–4 at Kleppe at 7, 10, 13, 16, 19 and 22 h, and the results tabulated nd analyzed statistically in great detail. Differences (in each month) are also compared ith those of previous tests at Aas, and Blindern, with the Assmann screen as the standard. he text and illustrations go into great detail regarding the station and its surroundings, the ethod of conducting the tests, the 4 patterns of screens, effect of season, time of day and eather conditions—radiative effects, lag of thermometers in different screens, etc. Kleppe arm) is located at 60°31′N, 5°33′E, elevation 250 m, in central Osterøya, a large island in estern Norway. Conclusion is that the Mork screen is very close to the standard Norwegian nd the Assmann screen in performance. In the late afternoon the Mork screen is distinctly etter than the standard, as it is not so sluggish. The small Linke and Sterten screens have reater radiation errors but less sluggishness than the layer screens, so they are better early the morning and late in the day, but give too high temps. in midday, if it is clear. The inke screen is the better of the two. The shelter designed by E. Mork is considered the best r local climatic studies, but it is hard to transport and to screw together or unscrew. For ort term observation programs the Linke screen is recommended. *Subject Heading:* **Thermometer shelter comparison.**—*M.R.*

10.1–16 551.591.6:551.578.4

*Eldridge, Ralph G.; Johnson, John C. and Clarke, Eric T., **Experimental measurements of ffuse transmittance in real atmospheres.** Technical Operations, Inc., Arlington, Mass.,

Contract AF 19(604)-988, Final Report, Dec. 1, 1956. 60 p. appendices. 27+39 figs., tables. **DWB** (M91 T255ex)—A report covering quite thoroughly (by means of curves of intensity vs range) the effects of haze, mist, fog, rain, snow, clouds, etc. of various intensities, types or thicknesses on visibility or transmittance of pulsed light, from an isotropic source using 12 ECA photoswitch Division Visibility Photometers. Theory, data from a large number of tests presented statistically and in graphical form, and photographs showing equipment and operation in launching tethered balloons carrying light source are included. Some light sources were in free balloons or were dropped from airplanes with parachutes. Studies were also made of diffuse transmittance above a snow cover (with albedo 0.7–0.8) over Sebago Lake, Maine (11 flights). Meteorological observations were taken for each test. *Subject Headings:* **1. Atmospheric transmittance 2. Diffuse transmittance above snow cover 3. Visibility photometers 4. Slant visibility data 5. Cape Cod, Mass. 6. Sebago Lake, Maine.** —*M.R.*

10.1–17 551.551:533.15:551.524.7

Spengos, A. C. and Cermak, J. E., **Turbulent diffusion of momentum and heat from a smooth, plane boundary with zero pressure gradient.** Colorado. Agricultural and Mechanical College, Fort Collins. Dept. of Civil Engineering, Contract AF 19(604)-421, Final Report, **Pt. 1, Experimental equipment,** Aug. **1956.** 36 p. 16 figs. (incl. photos), table, 9 refs., 8 eqs. **Pt. 2, Presentation of data and analysis.** Dec. **1956.** 77 p. 41 figs., 2 tables, 13 refs., 21 eqs. **DWB**—Wind tunnel equipment, used for a systematic study of the effect of lapse rates on turbulent diffusion of momentum and heat from a smooth plane boundary layer with zero pressure gradient, is described and illustrated and the results of the experiments presented in graphical form. Methods of measuring mean velocities, mean temps., intensities of turbulence and turbulent shearing stress, temp. fluctuations, turbulent heat transfer rates and heat input are discussed and illustrated in Pt. 1. Vertical distributions of mean velocity and eddy viscosity are given for both neutral and lapse conditions, and vertical distribution of mean temp., effect of lapse on correlation coefficients, on isotropy ratio, on mixing length and mixing velocity, mixing length ratio and intensity of temp. fluctuations at lapse rate conditions are treated in Pt. 2 for velocities of 6 to 35 ft/sec. and 60° to 120°F. *Subject Headings:* **1. Turbulent diffusion of momentum and heat 2. Lapse rate effects on turbulent diffusion 3. Wind tunnel turbulence data.**—*M.R.*

10.1–18 551.511:551.551:551.557.2

Solot, Samuel B. and Darling, Eugene M., Jr., **Theory of large-scale atmospheric diffusion and its application to air trajectories.** *U. S. Air Force. Cambridge Research Center, Geophysical Research Papers,* No. 58, June **1958.** 10 refs. 3 vols. Vol. 1 (25 p.), **Text.** Vol. 2 (362 p.), **Probability tables for various constant values of mean zonal wind.** Vol. 3 (371 p.), **Probability tables for North America and Eurasia. DLC**—A voluminous study attempting to provide an adequate theory of large scale atmospheric diffusion to take the place of limited and biased empirical (e.g., high level balloon) data. G. I. Taylor's theory of diffusion for small-scale eddies has been adapted for large scale circulation (to predict atomic fallout) by simplifying the patterns with C. E. P. Brooks' circular normal distribution assumption. Tables are provided for finding the probability field as a function of time for various constant values of mean zonal wind along constant pressure surfaces for a particle originating from a given point on the earth (using spherical coordinator). The tables in Vol. II and III are for probability density downstream with respect to latitude of E-W displacement for 1, 3, 6 and 12 days within T days for Jan. Apr., and July and Oct. at 40,000 to 80,000 ft. Methods for various initial latitudes (30° to 70°N) and resulting tabular and graphical cross sections, nomograms, analyses, and correlations are presented in text along with maps of probability fields for North America for Jan. and July for 50,000 ft for 1, 2 and 3 days and ratio of wind speed at 20,000 to 85,000 ft to that at 20,000 ft averaged for 5 days for U. S. Graphs of seasonal variations of mean zonal wind at 40,000 and 80,000 ft over Europe and North America etc. are included. *Subject Headings:* **1. Large scale diffusion 2. Air trajectory prediction 3. Atmospheric diffusion 4. Balloon trajectories 5. Fallout probability prediction 6. Upper air winds 7. North America 8. Eurasia.**—*M.R.*

10.1–19 551.578.73(47)

*Pastukh, V. P. and Sokhrina, R. F., **Grad na territorii S.S.S.R.** [Hail in the U.S.S.R.] *Leningrad. Glavnaia Geofizicheskaia Observatoriia, Trudy*, No. 74:3–31, **1957.** fig., 4 tables, map. **DWB**—Cites cases of remarkable hail occurrences in various parts of the U.S.S.R. and discusses at length the influence of terrain, lakes, etc., on the formation of hail. Includes isoline maps of the U.S.S.R. giving average annual number of days with hail, supplemented by graphs of the monthly mean and maximum frequencies for about 90 stations, and tables of the monthly maximum frequencies at 331 stations, based on data for 1891–1950. Some data on the diurnal variation of hail occurrence and its duration are also given. *Subject Headings:* **1. Hail frequencies 2. Long period records 3. U.S.S.R.**—*R.S. Quiroz.*

10.1–20 551.577.3

*McDonald, James E., **Variability of precipitation in an arid region: a survey of characteristics for Arizona.** Arizona. Univ. Institute of Atmospheric Physics, Contract NSF-G1101, Technical Reports on the Meteorology and Climatology of Arid Regions, No. 1, Dec. 31, **1956.** 88 p. 16 figs., chart (fold.), 20 tables, 20 refs. **DWB** (M85.53 A719t)—Records of precipitation for 8 stations in Arizona dating back 48–83 yrs (Flagstaff and Tucson, respectively) are analyzed to show details of space and time variability as they affect water resources in an arid or semi-arid region. Coefficients of variation are compared with other areas, differences between summer and winter analyzed, confidence intervals of means, secular trends in seasonal precipitation (double-mass analysis and decadal moving averages), decline since 1920's, regional differences in Arizona, autocorrelation of seasonal and annual precipitation, persistence of monthly precipitation, diurnal variation in Jan. and Feb., July and Aug. precipitation, interstation correlations and regressions treated as a pilot project for punched card program, which would use more evenly spaced and denser network for cooperative stations in Arizona. *Subject Headings:* **1. Precipitation variability in Arizona 2. Statistical methods of precipitation analysis 3. Arizona.**—*M.R.*

10.1–21 551.577.22

*Macky, W. A., **Rainfall of Bermuda.** *Bermuda. Meteorological Office, Technical Note*, No. 8, **1957.** 58 p. 13 figs., 39 tables. **DWB** (M(055) B516t)—A neat pamphlet in which many aspects of rainfall averages, extremes, duration and frequency are analyzed, using records from 1852–1956 for Bermuda (except for 1863–5). The records were obtained at several sites, but remained at Observatory Cottage, Prospect from 1870–1932. All original records were lost in a fire in 1955, so printed records were used in most cases. Sources of data, sites, time of observation, annual totals, extremes for consecutive years, monthly variations, driest and wettest series of months and quarter of a month, number of rainy days and frequency of months with given number of rain days, average fall per rain day, maximum daily, hourly and 1–12 hourly, diurnal variation duration frequencies, dry periods and droughts, wind effects and local and long period variations, and water supply are treated with ample tables and graphs. *Subject Headings:* **1. Rainfall duration frequencies 2. Rainfall, Bermuda 3. Drought data 4. Bermuda.**—*M.R.*

10.1–22 551.579(47) 551.582.2(47)

†*Rogov, Mikhail M., **Gidrologiia del'ty Amu-Dar'i: geografo-gidrologicheskaia kharakteristika.** [Hydrology of the delta of the Amu Darya: geographic, hydrological characteristics.] Leningrad, Gidrometizdat., **1957.** 253 p. 86 figs., 55 tables, 184 refs. **DLC** (GB1356.A5R6)—A hard-cover monograph (750 copies) for scientific and engineering workers and students in the fields of geography, hydrology, agriculture, fish conservation and river transport, interested in the Amu Darya delta of the Kara-Kalpak A.S.S.R. (N.W. Uzbek SSR, S.E. of Lake Aral). The history of hydrographic studies of the region from Arab times (9th century) to 1954 (Oceanographic Institute studies), general geography and hydrography, climate (p. 45–62), geology, geomorphology, soil cover, vegetative cover, crops, runoff, floods, ice, water balance (p. 137–145), hydrochemical regime, erosion, dynamics of the river network at the delta, etc. are discussed. The chapter on climate gives a thorough discussion, with illustrative tables, of pressure, temperature, wind, precipitation, snow cover, frost or freezing

temperatures, etc. for 4 stations (Kungrad, Muinak, Nukus and Chimbaĭ) ranging from 42–43°N and 59–60°E, and 56–76 m elev. Records date from 1912–1949, but are broken. Wind frequencies, wind energy from each direction, moisture deficit, temperature difference between stations, absolute humidity (and difference in absolute humidity between Chimbaĭ and Kungrad), diurnal temperature and humidity variation, frequency of precipitation of $\geq$0.1, 0.5, 1.0, 2.0, 5.0 and 10–20 mm, and snow cover data are presented. Evaporation and evapotranspiration losses in the delta, wind speeds over the open water and over reeds (both on land and on water) are covered in chapter on water balance. *Subject Headings:* **1. Hydrology of Amu Darya delta 2. Climate of Amu Darya delta 3. Water losses 4. Evapotranspiration from marshes 5. Amu Darya, Kara Kalpak, A.S.S.R.**—*M.R.*

10.1–23 551.582.2(47) 551.579.1:551.482

*Abramovich, D. I., **Reka Pakhra kak primer malykh rek moskovskoĭ oblasti.** [The Pakhra River as an example of a small river in the Moscow Oblast.] *Akademiia Nauk SSSR, Institut Geografii, Trudy*, 38, **1946.** 51 p. 12 figs., 29 tables, 16 refs. **DLC** (GB236.A4)—In this comprehensive hydrological study of the Pakhra River Basin, the climate is described and available records analyzed on p. 18–23 and the precipitation as it affects runoff on p. 23–29. Precipitation and temperature data from a dozen stations for upwards of 15 yrs are tabulated in various ways. Geological, geographical and vegetative as well as hydrological factors are discussed in the remainder of the monograph. *Subject Headings:* **1. Climate of Pakhra River Basin 2. Precipitation data 3. Runoff data 4. River basin studies 5. Pakhra River Basin, Moscow Oblast, U.S.S.R.**—*M.R.*

10.1–24 551.509.52:551.515.2

Gherzi, Ernest, **The forecasting of tropical cyclones.** New Orleans, La., Loyola Univ., **1958.** 86 p. photos, charts, figs.—A summary of the techniques used at Zi-ka-wei Observatory for 35 yrs, during which 150 full typhoons passed over or affected Shanghai. Pressure, humidity, electricity (sferics), clouds, tides, wind, rain, sea waves, thundery conditions, easterly waves and cold pools are discussed as to their value in indicating or forecasting typhoons. Motion and speed of typhoons are also considered. The detailed techniques used when a typhoon is suspected are outlined and the operations with respect to observing and issuing warnings described. An appendix gives some practical hints regarding typhoons in the Far East (especially for mariners) and another takes up forecasting typhoon motion by means of ionospheric correlation with surface and masses. Examples are cited throughout. *Subject Headings:* **1. Typhoon forecasting 2. Zi-Ka-Wei Observatory, China.**—*M.R.*

10.1–25 551.311.1

Lutkovskiĭ, Sergeĭ Vasil'evich, **Obrazovanie l'da v ozerakh, rekakh i moriakh.** [Formation of ice in lakes, rivers, and seas.] Moscow, Akademiia Nauk SSSR, **1957.** 114 p. 33 figs., 6 tables, 12 refs. **DWB** (551.311 L973ob)—A pamphlet (5000 copies) taking up the various aspects of river, lake and sea ice from crystal formation to ice forms, ice formation, growth, physics, properties, distribution in Arctic, movements, deformation, influence of hydrometeorological factors, disappearance and forecasting. Special forms of ice are illustrated. Some of the properties and the distribution are given in illustrative tables or graphs. *Subject Headings:* **1. Ice formation and properties 2. Sea ice 3. River ice 4. Lake ice.**—*M.R.*

10.1–26 551.594.6:621.396

George, T. S., **Investigation of atmospheric radio noise.** Florida. Univ. at Gainesville. Engineering and Industrial Experiment Station, Contract AF 19(604)-876, Final Report, Nov. 15, **1957.** 122 p. 65 figs., 8 tables, numerous eqs. **DWB** (M94.6 F636i)—A voluminous statistical report complete with statistical tables, numerous nomograms and scatter diagrams, wiring diagrams, recorder records, etc. covering the interference effect of atmospheric noise on radio teletype, radiotelegraph, radiotelephone and multiplex teletype; studies of atmospherics waveforms, a meteoric signal analyzer, a lightning stroke counter, and VLF ground wave polarization. It is concluded that the distribution of the noise envelope approximates the log-normal curve, and that it varies directly as a power of bandwidth where the power was approximately 0.34 and compares with the value of 0.5 for pure fluctuation noise. *Subject Headings:* **1. Spherics 2. Sferics effects on radio communication systems.**—*M.R.*

10.1–27 551.501.83:551.594.6

†Sullivan, A. W.; Hersperger, S. P. and Brown, R. F., **Investigation of atmospheric radio noise.** Florida. Univ. at Gainesville. Engineering and Industrial Experiment Station, Contract AF 19(604)-876, Scientific Report, No. 10, Jan. 20, **1956.** 95 p. 14 figs., 6 refs., 31 eqs. 52 abstracts. **Atmospheric waveforms bibliog.** p. 45–57 (151 refs.). Also: Sullivan, A. W.; Brown, R. F. and Nawricki, P. J., Scientific Report, No. 11, April 15, **1956.** 79 p. 22 figs., 3 tables, 25 refs., 26 eqs. **DWB**—In Report No. 10 the effect of atmospheric noise on a radioteletype system is discussed and a statistical model presented. Waveforms received from 380 mi are analyzed at source and at the receiver and the noise peaks found to be distributed according to a log-normal distribution law at the receiver but not at source. A bibliography on p. 45–57 lists 151 references of which 52 are abstracted or summarized (at some length) on p. 58–92, and an author index appended. The items are classified according to: (1) lightning discharge mechanisms, (2) electromagnetic radiations from lightning and (3) ionosphere and propagation of sferics. In the second report the correlations between the performance of the teletype and the noise distribution functions are examined and studies of VLF ground-wave polarization begun. *Subject Headings:* **1. Radio teletype noise 2. Sferics 3. Sferics bibliographies.**—*M.R.*

10.1–28 551.510.535

†*Kallmann, H. K., **A study of the structure of the ionosphere.** *Rand Corporation, Santa Monica, Calif., (Papers)*, P-638, Feb. **1955.** 164 p. 14 figs. (some fold.), 18 tables (some fold.), 162 refs., 53 eqs. Thesis (Ph.D.), Univ. of Calif. at L.A. (**1953?**) [Pub. in the *Physical Review*, April 1, **1953**]. **DWB**—An attempt at a realistic model of the upper atmosphere and ionosphere, based on the latest observational and theoretical results, especially with rockets, radio and acoustical soundings, meteor trail studies and auroral-airglow spectroscopy. Chapters include history, technique, physical properties up to 80, and from 80–220 km; the solar atmosphere, theory of ionization and recombination plus extensive numerical tables and diagrams giving coefficients, spectroscopic data, constants, observational data and models of the various elements. *Subject Headings:* **1. Ionospheric models 2. Ionospheric data.**—*M.R.*

10.1–29 551.521.1:550.385.26

*Cain, Joseph C., **Analysis of the solar and lunisolar daily variations in the geomagnetic field at Sitka, Alaska, 1902–1952.** Alaska. Univ. Geophysical Institute, Contract AF 19(604)-503, Final Report, Sept. 1952–Sept. 1956. pub. **1957.** 123 p. 15 figs., 28 tables, 12 refs., eqs.—Fifty years (1902–1953) of hourly geomagnetic data for Sitka, Alaska (geomagnetic lat. 60°N) are analyzed for solar (S) and lunisolar (L) daily variations of the 3 elements. Days are classified according to magnetic activity and according to Zurich daily relative sunspot numbers. An assymmetry in the seasonal variation of the component *H* of the quiet day, solar variation was noted. Extensive tables and graphs of all the elements are included in this sizeable report. *Subject Headings:* **1. Geomagnetic data analysis 2. Diurnal solar geomagnetic variations 3. Diurnal lunisolar geomagnetic variations 4. Sitka, Alaska** —*M.R.*

POPULAR METEOROLOGY

See also: **Expeds., Mirny, Antarctica** (Červinskas), 10.1–58; **Antarctic expeds.** (Kemp), 10.1–59.

10.1–30 551.5(023)

Gal'tsov, Aleksandr Petrovich, **Klimat i pogoda.** [Climate and weather.] Moscow, Gosud. Izdat. Kul'turno-Prosvetitel'noĭ Literatury, **1957.** 70 p. 11 figs., 5 refs. (*Bibliotechka v pomoshch' lektory*, No. 1.) **DWB, DLC** (QC863.G29)—A popular (50,000 copies) pamphlet on climate and weather, solar energy, factors which control climate, effects of earth's surface, cause of winds, hydrological cycle, climatic zones, climatic changes, and methodology. A few schematic diagrams break up the monotony of the text, especially in the chapter on winds and general and local atmospheric circulation. The purpose of the pamphlet is to give information about climate and weather to a popular lecturer or speaker. The author wrote a more comprehensive brochure in 1953 entitled **Atmosfera i pogoda** [Atmosphere and weather] as No. 10

of series *V Pomoshch' Lektory*. *Subject Headings:* **1. Popular meteorology pamphlets 2. Climate and weather.**—*M.R.*

10.1–31 551.507.362.2

Mallan, Lloyd, **Space satellites.** N. Y., Fawcett Publications, Inc., **1958.** 144 p. photos. (*Fawcett Book*, No. 364.) **DWB** (629.1388 M252sp)—A large illustrated popular pamphlet giving some scientific and technological aspects of earth satellites and space vehicles, moon rockets, the Russian "Sputniks," launching problems and equipment, Operation Minitrack and Project Moonwatch. Illustrated articles on rocket development, instrumentation, military, political and economic possibilities, transportation aspects, amateur activities connected with space flight are included. *Subject Headings:* **1. Space travel 2. Satellite observatories 3. Rocket technology.**—*M.R.*

10.1–32 551.507.362.2

Shternfel'd, A. A., **Iskusstvennye sputniki Zemli.** [Artificial earth satellites.] Moscow, Gosud. Izdat. Tekhniko Teoreticheskoĭ Literatury, **1956.** 179 p. 27 figs., 10 tables. **DWB** (629.1388 S561is)—A general account (75,000 copies) for popular consumption of the atmosphere, methods of studying it, laws of movement of artificial satellites, uses in observing and recording weather and astrophysical elements of events, problems of observation and transmission, trajectory and height of sputniks, techniques of firing and control, conditions on board a sputnik, communication with the earth, and legal aspects of space and space flight. The book was published "before sputnik" but contains imaginative illustrations of possible space travel vehicles. *Subject Heading:* **1. Satellite observatories.**—*M.R.*

10.1–33 551.5:633.2

Mogileva, Anna Mikhailovna, **Pogoda i travy.** [Weather and grasses.] Leningrad, Gidrometizdat, **1957.** 57 p. 17 figs., 3 tables, eqs. **DWB** (M:63 M696po)—A popular pamphlet (5000 copies) taking up the effects of climate on various fodder grasses growing in the Soviet Union, and agrometeorological and technological measures used in the more advanced kolkhoz and sovkhoz farms to determine, from temperature and precip., the time of planting, harvesting or cutting and storing hay, the moisture content of hay; from soil moisture data, the quality and quantity of fodder; and from winter temp. and snow depth data, the conditions for spring growth of perennial grasses, etc. Also points out that the knowledge of climate of a particular area should enable better use of land and choice of crops to suit the climatic conditions or probabilities as estimated from past records. The 4 chapters cover: 1) basic forms of feed grasses; 2) climate and the distribution of grasses in the U.S.S.R.; 3) relation of grass to meteorological conditions; 4) importance of agrometeorological observations and forecasts, the forecasting service to farmers and cattle or sheep herders, etc. *Subject Headings:* **1. Agrometeorological techniques 2. Climatic effects on grasses 3. Agrometeorological forecast service.**—*M.R.*

10.1–34 551.593

Constance, Arthur, **The inexplicable sky.** N. Y., Citadel Press, **1956.** 288 p. figs. **DWB** (523 C757i)—A popular book on pseudo-astrophysics with separate chapters on life on other planets, and on auroras, flying saucers, lightning, meteoroids and all manner of unusual natural phenomena which the author suggests and often insists are supernatural (i.e., unexplainable by any natural law). Numerous instances are cited to point up the "fact" that astronomers and meteorologists don't know what they are talking about when they "explain" such things as mirages, ball lightning, auroras, blood-rain, etc., since the authorities sometimes contradict each other. A chronological list of flying saucer sightings is appended. *Subject Heading:* **1. Flying saucers.**—*M.R.*

10.1–35 551.515.2(764)

Weems, John Edward, **A weekend in September.** N. Y., Henry Holt, **1957.** 180 p. photos. **DWB** (M15.2 W397w)—Another vivid account of the Galveston, Tex. hurricane of Sept. 8, 1900 (*see* 7J–5 and 7J–6, Nov. 1956, *MAB*), in popular book form. This storm, which took 8000 lives, is said to be the worst recorded disaster to hit the North American

Continent. The book is written in a personal narrative style, based on numerous books and articles and interviews. The writings of ISAAC and JOSEPH CLINE and DAISY THORNE GILBERT, who are the central figures of the narrative, were used extensively by the author. Both CLINES wrote autobiographies, and died 8 days apart (Aug. 3, 1955 and Aug. 11, 1955, at 93 and 84, resp.). Both were Weather Bureau officials (until they retired in 1935 after 53 yrs and in 1940 after 48 yrs, resp., with the service). *Subject Headings:* **1. Hurricane, Galveston, Tex. (Sept. 1900) 2. Galveston, Tex. I. Cline, Isaac M.**—*M.R.*

MANUALS AND ATLASES

See also: **Handbook of geophysics** (Geophys. Res. Directorate), 10.1–3; **Thunderstorm records, U.S.W.B.** (Baliles), 10.1–65; **U.S.W.B. climatological records** (Baliles), 10.1–66; **U.S.W.B. excessive precip. records** (Hagarty), 10.1–67; **History of U.S.W.B. climatological records** (Hagarty), 10.1–68.

10.1–36 551.582.3(498)

*Romania. Institutul Meteorologic Central, Bucharest, **Atlas climatologic.** [Climatological atlas.] 1949–. **Pt. 1-a, Regimul precipitatiilor.** [Precipitation regime.] issued **1949.** 1 p. text. 18 charts (in color). 40 × 62 cm. **Pt. 2-a, Regimul termic.** [Thermal regime.] issued **1954.** 1 p. text. 36 charts (in color). 43 × 31 cm. **Pt. 3-a, Regimul eolian.** [Wind regime.] issued **1954.** 1 p. text. 17 charts. 31 × 43 cm. **DWB** (M82.3/498 R936at)—These 3 large format atlases contain: 1) monthly, seasonal and annual isohyetal (10, 25 and 100 mm intervals) charts based on 35 yrs of record (1896–1915 and 1926–40; 2) somewhat smaller isothermal charts for each month, season and for the year, based on same period of record, plus charts of the annual range of temp., absolute maximum and minimum temp. and date, mean date of first and last freezing and of frost free period and of temp. $\geq 5°C$, $\geq 10°C$, and percentage of year with low and high temps. ($\leqq 25$ and 30°C); and 3) monthly, seasonal and annual Baillie type wind rose charts for period 1931–40, using data for about 50 stations. *Subject Headings:* **1. Climatic atlases 2. Rainfall atlases 3. Temperature atlases 4. Wind rose atlases 5. Romania.**—*M.R.*

10.1–37 551.515.4(47)

Arkhipova, E. P., **Karty geograficheskogo raspredeleniia chisla dneĭ s grozoĭ na territorii SSSR.** [Maps of the geographical distribution of number of days with thunderstorms in the U.S.S.R.] *Leningrad. Glavnaia Geofizicheskaia Observatoriia, Trudy*, No. 74:41–60, **1957.** 2 figs., 5 maps. **DWB**—Contains annual and May, June, July, Aug. maps of isolines of mean number of days with thunderstorms, based on data for 2100 stations (varying periods of record in the years 1891–1948) compiled for the recent series of climatological handbooks of the U.S.S.R. Also includes, for 70 selected stations, graphs of the monthly mean and maximum number of thunderstorm days, and a useful review of earlier thunderstorm maps of the U.S.S.R. *Subject Headings:* **1. Thunderstorm frequencies 2. Long period records 3. U.S.S.R.**—*R.S. Quiroz.*

10.1–38 551.508.91:778.3 551.521.64

Gentner, W.; Maier-Leibnitz, H. and Bothe, W., **An atlas of typical expansion chamber photographs.** London, Pergamon Press, **1954.** 199 p. 294 photos. Title-page and text in English, German and French. **DLC** (QC783.5.G413)—A fascinating collection of nearly 200 cloud chamber photos showing typical paths of natural and artificial radiation, including X-rays and cosmic rays (both primary and secondary, showers, transmutation of elements by cosmic rays), gamma, beta and alpha rays, etc. under varying conditions (strong magnetic fields, electrical fields). In the Introduction, the Nobel Prize Lecture of C. T. R. WILSON (1928) is cited to give the background of the development of the Wilson cloud chamber from 1894–1911. *Subject Headings:* **1. Wilson cloud chamber 2. Expansion chamber photograph atlas 3. Cloud chambers. I. Wilson, C. T. R.**—*M.R.*

10.1–39 551.582:656.6(264)

§Hamburg. Deutsches Hydrographisches Institut, **Handbuch des Atlantischen Ozeans, Bd. 2, Südatlantischer Ozean.** [Handbook of the Atlantic Ocean, v. 2, South Atlantic Ocean.]

Completely rev. 4th ed. of the **Dampferhandbuch für den Atlantischen Ozean (1928).** Hamburg, pub. by the Institut, **1954.** 144 p. 18 figs., 5 plates (fold.) (Its *Number* 2057/11.) **DWB**—A standard "sailing directions" handbook with a chapter (III) on climate and weather (p. 5–38). This presentation is unusually analytical, giving tables and charts showing frequencies of the elements of importance to sea navigation: winds (gales), clear and cloudy days, fog, thunder, special winds, air and water temperature, precipitation, etc. The area covered (South Atlantic) is divided into several broad climatic zones for the sake of discussion and tabulation. Synoptic case histories (May 6, 10 and 20, 1952) involving storms and good weather types on crossing from South America to Africa are presented. A climatic calendar is included. *Subject Headings:* **1. Sailing directions 2. Climate of South Atlantic 3. South Atlantic.**—*M.R.*

10.1–40 551.510.42(02)

U. S. Robert A. Taft Sanitary Engineering Center, Cincinnati, **Air pollution meteorology: air pollution training course manual.** (1957) Loose-leaf. Each section renumbered. figs., tables, refs., eqs. **DWB** (M10.42 U5863ai)—This manual contains 14 pages of organized textual material on meteorology and climatology as applied to air pollution problems. Some of the subjects embraced are: application of meteorology to air sanitation, basic concepts, meteorological observations and instruments, upper air measurements, air motions and pollution, stability and local influences. Appended are general references or sources, a glossary of terms associated with different phases of meteorological relations, climatological aids in air pollution studies and their cost and manufacture, behavior of stack effluents, test apparatus for wind tunnel studies at N. Y. Univ., tracer techniques and many other random articles on diffusion, stagnation, etc. taken from various sources. *Subject Heading:* **1. Air pollution meteorology manuals.**—*M.R.*

10.1–41 551.5:629.13(02)

U. S. Bureau of Naval Personnel, **Aerographer's mate 1 and C.** Wash., D. C., Govt. Print. Off., **1956.** 400 p. figs., tables. (Its *Navy Training Courses, NAVPERS* 10364.) **DWB** (M87 U584ae)—A manual or study course to qualify aerographer's mate 3 and 2 for advancement to aerographer's mate 1 or C. Chapters on climatology, ocean weather, atmospheric physics, map analysis and forecasting, applied forecasting, electronic equipment used in aerology, other aerological equipment, supply and accounting, and administration. Appended are answers to questions at end of each chapter, plus a list of qualifications for advancement in rating, and an index. Gives nomograms and tables for such operations as forecasting breakers, waves or surf; sample synoptic charts and upper level or tropopause charts; diagrams of equipment; forms and methods of forecasting transmission ducts, ballistic conditions, etc. *Subject Heading:* **1. Aerographer's manuals.**—*M.R.*

GENERAL GEOPHYSICS AND METEOROLOGY

GEOPHYSICS

See: **Handbook of geophysics** (Geophys. Res. Directorate), **10.1–3.**

IGY

See also: **Belgian IGY Antarctic Exped.,** 10.1–52; **Radioactive fallout networks** (Harley), 10.1–190.

10.1–42 550.3:551.506.22

Webster, H. C. (*Univ. of Queensland*), **Australia's participation in the International Geophysical Year.** *Australian Journal of Science,* 19(4):142–144, Feb. **1957.** fig. **DLC**—The Australian Academy of Science is responsible for planning and coordinating IGY activities with those of other countries. The organization of IGY activities in Australia, their financial support, the various Australian universities (including the names of the directors), the Aus-

ralian contributions to the program, etc. are described. *Subject Heading:* **1. Australian participation in IGY.**—*I.L.D.*

10.1–43 551.506.22:551.594.5 551.506.22:551.521.64

Canadian study of cosmic rays and geomagnetism. *Science and Culture*, Calcutta, 21(12):730–731, June **1956. DLC**—Canada's IGY program on cosmic rays includes a station at 7000 ft near Banff (geomag. lat. 50°N) and others at Chalk River, Resolute and Ottawa. Monitors for measuring neutron component of cosmic rays will be in use at the latter 3 stations and at Churchill. Aurora and air glow will be studied at 5 stations. The Soviet Union will have 30 auroral and airglow stations in the U.S.S.R., 2 on the Arctic Ice Pack and 3 in Antarctica. Auroral radar will be in use at Ottawa, Baker Lake and Saskatoon. *Subject Headings:* **1. Canadian IGY program 2. Auroral stations for IGY 3. Cosmic ray stations for IGY 4. Canada 5. U.S.S.R.**—*M.R.*

10.1–44 551.506.22

Lahaye, E. (*Dir. Inst. Royal Met., Belgium*), **L'Année Géophysique Internationale (1957–1958). Participation de la Belgique.** [The International Geophysical Year (1957–1958). Participation of Belgium.] *Belgium. Institut Royal Météorologique, Contribution*, No. 40, **1958.** 11 pages. At head of each verso: Société Royale Belge des Ingenieurs et des Industriels. **DWB, DLC**—Account of the circumstances which led to the organizing of the IGY 1957–1958 and to the selection of the observation period. After the general considerations on the nature of the program and the network of the observation stations, the author goes into different phases of this program: world days, meteorology, geomagnetism, auroras and nocturnal sky glow, ionosphere, solar activity, longitude and latitude, rockets and artificial satellites. He summarizes the program of Belgian participation in the proceedings of the IGY such as that of the Belgian Antarctic Expedition, taking into consideration the scientific aspects of this expedition led by GASTON DE GERLACHE DE GOMERY. *Subject Headings:* **1. Belgian participation in IGY 2. IGY observation program 3. IGY networks.**—*A.V.*

10.1–45 550.3:061.3

Trojer, Hans, **El Año Geofísico Internacional 1957–1958.** [The International Geophysical Year, 1956/1957.] *Centro Nacional de Investigaciones de Cafe, Chinchina, Colombia, Biblioteca, Boletín Informativo*, 6(70):353–355, Oct. **1955. DWB**—General plans for IGY, 1957–58, in which Colombia will participate, and the importance of this effort for the little studied regions such as the high altitude portions of the tropics, and the Arctic and Antarctic, are discussed. *Subject Headings:* **1. International Geophysical Year, 1957–58 2. Colombian participation in IGY.**—*M.R.*

10.1–46 550.3:061.3

El Año Geofísico Internacional. [International Geophysical Year.] *Revista Meteorológica del Peru*, Lima, 2(3):12–20, Oct./Dec. **1956.** photos. **DWB**—The basic aspects of the International Geophysical Year are revealed as answers to a series of questions, including one on the nature of the Peruvian collaboration, the nature of the meteorological investigations; auroral, geomagnetic, ionospheric, astrophysical, glacial, oceanographic, seismal, gravimetric, cosmic ray, rocket and satellite studies. A full page model of the satellite is shown. A Peruvian Committee was formed by the Meteorological Service. Other agencies are cooperating (Huancayo Institute, etc.). *Subject Headings:* **1. International Geophysical Year, 1957–1958 2. Peruvian participation in IGY.**—*M.R.*

WMO–IUGG

10.1–47 551.5:061.3(26)

Langlo, K., **Second session of the Commission for Maritime Meteorology.** *World Meteorological Organization, WMO Bulletin*, 6(1):10–13, Jan. **1957.** 3 photos. **DWB**—A summary of activities and recommendations made at the second session of WMO CMM at Hamburg on Oct. 16–31, 1956. A new category of voluntary observing ships has been con-

sidered—the "Crawford" ships (heretofore the 3 classes were: selected, supplementary, and auxiliary ships). The "Crawford" ships, named after the proponent, A. CRAWFORD of the Union of South Africa, are ships plying in areas remote from the usual sea lanes and may not have standard meteorological equipment, but can report during IGY so coverage of the seas will be more extensive during 1957–58. Other IGY efforts concerning marine meteorology are mentioned. The CMM adopted 33 recommendations and set up 5 working groups. *Subject Headings:* **1. WMO. Maritime Meteorology Commission 2. WMO meetings 3. Crawford ships 4. Hamburg, Germany.**—*M.R.*

10.1–48 551.508:061.3

World Meteorological Organization. Commission for Climatology, **Abridged final report of the Second Session, Washington, Jan. 14–25, 1957.** *World Meteorological Organization, WMO [Publication]*, No. 62. RP. 25, **1957.** 61 p. **DWB**—A standard report on transactions of the second session of the WMO CCl in Washington under chairmanship of C. W. THORNTHWAITE. The new President-Elect is R. G. VERYARD of the U.K. Working groups, reports, recommendations and resolutions, lists of delegates, technical regulations changes, etc. are included in report. IGY data centers, CLIMAT reports, the **Climatic atlas,** etc. were major problems discussed. *Subject Headings:* **1. WMO. Climatological Commission 2. Climatological Commission sessions.**—*M.R.*

10.1–49 550.3:061.3

Meade, P. J., **International Union of Geodesy and Geophysics General Assembly, Toronto, 1957.** *Meteorological Magazine*, 87(1027):26–27, Jan. **1958. DWB, DLC**—The seven associations constituting the U.G.G.I. are listed; the opening of general assembly at Toronto in 1957 is described briefly and the fields of interest covered in the meteorological program are indicated. *Subject Heading:* **1. I.U.G.G. meetings.**—*I.L.D.*

ARCTIC RESEARCH

See also: **General and frontal circulation** (Bergeron), 10.1–208; **Record warm winters, Canadian Arctic** (Thomas, Titus), 10.1–251.

10.1–50 551.582.2(712.2)

*Canada. Meteorological Branch, **Climatological summary, Isachsen, N.W.T., Canada, May 1948 to Dec. 1953.** Toronto, **1958.** 99 p. numerous tables.—Six-hourly surface meteorological data for Isachsen, N.W.T. (78°47′N, 103°32′W) for 1949–1953, inclusive, and radiosonde and upper air wind data for 0300 and 1500 GMT from June 1948–Dec. 1953 are tabulated (from IBM cards) and presented in tables of original observations, frequencies and in mean adiabatic charts for Jan. and July. The text and most of the data are legible. Station location, changes and description of instruments and their location are described and shown on maps and diagrams. Frequencies of ceiling-visibility classes, of classified flying weather, of wind direction and speed, of wind speed, of temperature intervals and other data are summarized in Pt. I. *Subject Headings:* **1. Climate of Isachsen, Northwest Territories 2. Climatic data 3. Radiosonde data 4. Isachsen, Northwest Territories, Canada 5. Canadian Arctic.** —*M.R.*

10.1–51 551.5(98)

McGill Univ. Arctic Meteorology Research Group, **Studies in Arctic meteorology.** Contract AF 19(694)-1141, Final Report; Publication in Meteorology, No. 10, March **1958.** 60 p. 18 figs., 18 refs., eqs. **DWB**—This report contains extensive summaries of work in the following fields which had been covered in previous reports: I. The Arctic inversion; II. Specification of space variable for Arctic synoptic climatology by the Wadsworth and the Godson methods; III. Dynamical prediction of the Arctic circulation; IV. Contour variance and its significance; V. Synoptic regimes of the lower Arctic troposphere. *Subject Headings:* **1. Arctic meteorology 2. Inversions in Arctic 3. Synoptic climatology 4. Arctic. I. Hare, F. Kenneth.** —*M.R.*

ANTARCTIC RESEARCH

See also: **Min. temps. and radiative balance over snow** (McCormick), 10.1–250.

10.1–52 551.506.22/5

Expédition Antarctique Belge, 1957/1958, **Rapport de préparation technique.** [Report of technical preparation of Belgian Antarctic Expedition.] Brussels, May **1958.** 96 pages. numerous figs. and tables.—This report of technical preparation explains the solutions which were adopted to equip the wintering base with the means essential to the realization of the scientific program. All of the equipment to be used at the extreme exterior temperatures was tested in caissons at −60°C. The experimental assembling of the structures and of the principal equipment of the wintering base (generating sets, heating apparatus, etc.) was done before departure. Various trials of resistance and behavior were made in laboratories. This report of technical preparation reviews the solutions which have been adopted in the different fields concerned with the wintering of the Belgian Antarctic expedition (construction, heating, electricity, water, security, radio, transport by land, aerial means, fuels, individual outfits, food supplies, ships, etc.) *Subject Headings:* **1. Belgian participation in IGY 2. Belgian Antarctic Expedition, 1957–1958 3. Antarctic expeditions.**—*A.V.*

10.1–53 551.506.2(99):551.506.5(99)

*Stewart, R. H. A. (*Nautical College, Pangbourne, Berks.*), **Summary of observations at Shackleton, Antarctica 1956–1957.** *Royal Meteorological Society, Quarterly Journal,* 84(360): 176–179, April **1958.** 6 tables, 2 refs. **DWB, DLC**—Monthly mean and extreme temperature, pressure, wind, percent of sunshine, cloud amount; snow, gale, reduced visibility, drift snow and blizzard days at Shackleton—the Weddell Sea base of the trans-Antarctic Expedition at 77°59′S, 37°10′W (90 ft elev.)—from March 1, 1956 through Feb. 1957 are tabulated and discussed briefly. Five observations a day were made until Sept., and 8 a day after Sept. The data for Jan. and Feb. 1957 were obtained by radio. Extreme minimum temp. was −53°C in Aug. (1956) and maximum −1.7°C in Dec. *Subject Headings:* **1. Observational data 2. Climate of Shackleton, Antarctica 3. Expeditionary meteorological data 4. Shackleton, Antarctica.**—*M.R.*

10.1–54 551.311.1(99) 551.577(99)

†*Swithinbank, Charles, **The morphology of the ice shelves of western Dronning Maud Land.** *Norwegian-British-Swedish Antarctic Expedition,* 1949–1952, *Scientific results,* Vol. 3 (Glaciology), Pt. A, issued Norsk Polarinstituut, **1957.** p. 1–37. 8 figs., 5 plates, 62 refs. Also his: **Regime of the Ice Shelf at Maudheim as shown by measurements.** *Ibid.,* Vol. 3, Pt. B, p. 41–75. 9 figs., plate, 2 tables, 27 refs. Also his: **The movement of the ice shelf at Maudheim.** *Ibid.,* Vol. 3 (Glaciology I), C, pub. Oslo, **1958.** p. 81–95. 9 figs., 12 refs. **DWB** (919.9 N892s)—In Pt. A, there is a thorough discussion with vivid photographs, maps and diagrams of the investigations of the five ice shelves in Queen Maud Land. Antarctica (the Norwegian Sector, between 20°W and 45°E), to about 500 km from the coast, during the 2 years March 1950–Jan. 1952. The physical features, the nature and extent of ice shelves, erosional development of seaward margin, the inland margin, surface features (crevasses, undulations, wind-formed irregularities, and cracks), characteristics of the five ice shelves one by one, and conclusions regarding floating, groundings and ablation (about 30 km of the ice front at Maudheim shelf is aground); for example, an ice shelf, unless flanked by land or by inland ice sheets, will never extend far to sea beyond the outermost shoals which could ground it. In Pt. B, daily accumulation measurements are tabulated for a score of stakes. Precipitation records, relation of accumulation to wind, local variations, possible errors and their magnitude, water equivalent from snow gage, seasonal trends in wind, temperature, precipitation, etc., are discussed and shown in large charts and graphs. A mean total of 143 cm of snow was recorded in 22 months at all stakes not subject to abnormal influences. Rime and hoar frost were not mentioned. Very little ablation (or evaporation) occurred, and most of the accumulation came with strong cyclonic NE to E winds—none due to drift from interior. Pt. C discusses methods of measuring movement of shelf ice (by means of 18 stakes over 34 sq km), surveys made several months apart, computation of absolute and relative movement and, finally, the material balance of the ice mass. *Subject Headings:* **1. Ice shelves 2. Glacial**

climates 3. Glacial ablation 4. Precipitation measurements 5. Norwegian-British-Swedish Antarctic Expedition, 1949–1952 6. Queen Maud Land, Antarctica.—*M.R.*

10.1–55 551.506.5:551.55(99)

§†*Hisdale, V., **Wind.** *Norwegian-British-Swedish Antarctic Expedition*, 1949–1952, *Scientific results*, Vol. 1, Pt. 2 (Surface Observations) B, issued by Norsk Polarinstituut, **1958.** p. 67–121. 41 figs., 24 tables, 19 refs. **DWB**—An elaborate compilation of 3-hourly wind readings from March 26, 1950 to Jan. 13, 1952 (659 days) at 10 m above the ground at Maudheim (70°3′S, 10°56′W). The Introduction discusses the site, instruments and methods of observation. Ch. 2 discusses and presents graphs, histograms, wind roses and tables consisting of Pt. 2) wind direction-speed frequency distribution for each season (Dec.–Feb., March–May, June–Aug., Sept.–Nov.), each half of year and each year, and for the whole period. Wind roses are presented for each half year and for the period. Synoptic charts show characteristic situations for easterly and for southerly wind (at Maudheim), respectively. Frequency distribution of wind directions and speeds are compared for Kerguelen, Maudheim, Snow Hill, Cape Evans and Gauss Strait, etc. More sophisticated statistical analyses are made of frequency of speeds for easterly and southerly winds and gales; 3) mean values, vector mean winds, variation of mean speed with direction, mean speed regardless of direction, mean air transport (for Little America and Maudheim); 4) characteristics of wind variability, steadiness, duration of wind from different directions, same for light and for strong winds, standard deviations, serial correlations; 5) diurnal variations of frequency distributions and of vector mean winds and scalar means; 6) wind and pressure relations. Observations are concentrated around the easterly and the southerly direction, with some variations with time of day, of year or synoptic situation. *Subject Headings:* **1. Wind data analysis 2. Norwegian-British-Swedish Antarctic Expedition, 1949–1952 3. Maudheim, Antarctica.**—*M.R.*

10.1–56 551.506.5(99)

Doyen, Paulette (*Comité Spécial de l'Année Géophysique Internationale*), **Les expéditions antarctiques au cours de l'été austral 1957–1958.** [Antarctic expeditions during the summer of 1957–1958 in the Southern Hemisphere.] *Ciel et Terre*, Brussels, 74(5/6):257–272, May/June **1958.** chart, 2 refs. **DLC**—The present article constitutes a restatement, as of April 1, 1958, of the research carried out in the Antarctic during the summer of 1957–1958. The author dwells upon the organization of the field work or the missions presenting a peculiar character, rather than upon the scientific IGY program executed at the settled bases. The author reviews the research carried out by the different countries, he gives an account of the mission accomplished by Sir Edmund Hillary and of the common Fuchs-Hillary mission. He points out that the seismic observations undertaken by several missions will make it possible to draw up a first table of the sub-glacial topography and gives notice of the founding of a Special Committee of Antarctic Researches (SCAR). (For 1955/56 and 1956/57 seasons, *see* 9.5–31, May 1958, *MAB.*) *Subject Headings:* **1. Antarctic expeditions 2. IGY Antarctic program 3. Seismic soundings 4. Antarctica.**—*A.V.*

10.1–57 551.582(99)

Shaw, P. J. (*Central Office, Melbourne*), **The climate of Mawson during 1955.** *Australian Meteorological Magazine*, Melbourne, No. 18:1–20, Sept. **1957.** 3 figs., 2 tables, 6 refs. **DWB**—This paper is principally a description of the climate at Mawson. The prevailing wind is shown to be katabatic. As yet no complete model has been deduced for the characteristic sudden wind changes. The summer westerly wind is shown to be a sea breeze, and the existence of sea-ice is shown to reduce wind speed. There is a tendency for the tropopause to vanish in winter, due to radiative cooling aloft. The distribution of humidity near the ground is used to estimate ablation of plateau ice. Details of snow and sea ice are given which may be of use to analysts. *Subject Headings:* **1. Climate of Mawson 2. Mawson, Antarctica.**—*Author's abstract.*

10.1–58 91.04(99) 551.506.22(99)

Červinskas, Eduardas, **Antarktida.** [Antarctica.] Vilna, Valstyvine Politinės ir Mokslinės Literatūros Leidykla, **1957.** 181 p. figs., photos, charts, 24 refs. **DLC** (G870.C4)—A popular account (in Lithuanian) of the various discovery and exploration expeditions to

the Antarctic, including notes on the current IGY effort, especially at the Soviet "Mirny" base. A chapter is devoted to each of the main expeditions of Ross, Amundsen, Scott, Byrd, Mawson, Shackleton, etc. *Subject Headings:* **1. Antarctic expeditions 2. IGY Antarctic expeditions 3. Mirny, Antarctica.**—*M.R.*

10.1–59 91.04(99) 551.506.22

Kemp, Norman, **Conquest of the Antarctic.** N. Y., Philosophical Library, **1957.** 152 p. photos. **DLC** (G870.K45)—A popular but informative book on the history of Antarctic expeditions, the IGY, Shackleton's expeditions, the Commonwealth Expedition of 1956 under Fuchs, Byrd and Operation Deep Freeze, New Zealand's effort under Edmund Hillary, the Royal Society base for IGY at Halley Bay, Australian explorations (Mawson) and the first permanent Antarctic Base at Mawson, Soviet work (Mirny), French effort (Adélie Land), etc. *Subject Headings:* **1. Antarctic expeditions 2. IGY Antarctic bases.**—*M.R.*

SERVICES, INSTITUTIONS AND OBSERVATORIES

See also: **Climate effects on grasses** (Mogileva), 10.1–33.

10.1–60 551.5:06

The Munitalp Foundation, Inc. *American Meteorological Society, Bulletin*, 38(10):612–614, Dec. **1957.** photos. **DWB, DLC**—A nonprofit organization founded by the late Albert W. Johnston of Greenwich, Conn. First meeting of the Trustees in Nov. 1951 was advised by Sverre Petterssen, Horace Byers and V. J. Schaefer of General Electric, now Director of Research of Munitalp Foundation, Inc. Cloud Physics was selected as area most suitable for concentrated endeavor. A few research associates, a list of individuals and organizations that have received grants, projects of its own and educational activities, lectures, publications (occasional papers), field projects such as Project Skyfire and Time Lapse Movie Camera Project are included. *Subject Headings:* **1. Munitalp Foundation, Inc. 2. Meteorological research institutions.**—*M.R.*

10.1–61 551.501.9:550.3

Bossolasco, M. and Dagnino, I., **L'Osservatorio di Monte Capellino dell'Università di Genova.** [The Monte Capellino Observatory of the Genoa University.] *Geofisica e Meteorologia*, Genoa, 4(6):109–113, Nov./Dec. **1956.** 4 figs., 5 refs. **DWB**—The Monte Capellino Geophysical Observatory was established by the Institute of Geophysics of the Univ. of Genoa on a ridge of the Ligurian Alps about two km east of Passo dei Giovi. The choice of the site and the location of the various installations including the recorders of the weather elements, atmospheric electricity, geomagnetic phenomena, etc. are described. An account is given of the ionosphere, geomagnetic, geoelectric and meteorological installations and of the observations carried out. These include the characteristics of condensation nuclei, ozone and salt content of the atmosphere, atmospheric electricity, etc. A map showing the location of the Observatory is included. *Subject Headings:* **1. Geophysical observatories 2. Monte Capellino Observatory, Italy.**—*I.L.D.*

CONFERENCES AND SYMPOSIA

See: **Auroral symposia, 10.1–1; Theoretical geophys. conf., 10.1–2; Arid zone climatology symposia, 10.1–6**

EDUCATION, HISTORY AND BIOGRAPHY

EDUCATION

10.1–62 551.5:37:064

Stinson, J. Robert, **Greater Saint Louis Chapter of the American Meteorological Society invests in the future of meteorology.** *American Meteorological Society, Bulletin*, 38(10):622–623, Dec. **1957.** 3 figs. (photos).—The Chapter sponsored students, who demonstrated interest in some phase of meteorology through Science Fair Exhibits, as guests at its annual

banquet on June 3, 1957 where the Exhibits were displayed. Three cash prizes were given for exhibits (which are shown in illustration). *Subject Headings:* **1. Meteorological education 2. Weather exhibits.**—*M.R.*

10.1–63 551.509.2/3(02)

Bergeron, Tor, **A new era in teaching synoptic meteorology.** (In: **Festskrift tillägnad Vilhelm Bjerknes, den 14 Mars 1942.** Stockholm, Centraltryckeriet, **1942.** p. 51–74. refs.) **DWB**—BERGERON reviews (chapter by chapter) the text of the Russian edition of S. P. KHROMOV's 1937 work on synoptic meteorology (translated and supplemented by SWOBODA and KOŇCEK in the German ed., 1940). The original Russian work, based partly on lectures given by T. BERGERON in the U.S.S.R. in 1930 and 1932 (*see* 8C–22, March 1957, *MAB*), is said to be the only textbook on synoptic meteorology for up-to-date teaching of the Bergeron techniques of analysis and forecasting. The history of synoptic analysis and aerological techniques from the 1860's is reviewed quite thoroughly. *Subject Headings:* **1. Synoptic meteorology textbook reviews 2. Synoptic meteorology textbooks. I. Khromov, S. P. II. Swoboda, G. III. Koňcek, M.**—*M.R.*

HISTORY

See also: **Hist. of Antarctic expeds.** (Kemp), 10.1–59.

10.1–64 551.506.3(429)

Oliver, J. (*Dept. of Geog., Univ. College of Swansea*), **William Bulkeley's record of the weather of Anglesey 1734–1743, 1747–1760.** *Royal Meteorological Society, Quarterly Journal,* 84(360):126–133, April **1958.** 5 tables, 11 refs. **DWB, DLC**—The study of climatic fluctuations before the nineteenth century is hindered by the paucity and poor distribution of instrumental records, and increasing reliance must be placed upon diaries and other descriptive sources. The diary of WILLIAM BULKELEY of Anglesey, over the period between 1734 and 1760, has been examined. From the information it contains, resultant wind directions and constancy have been calculated. Frequencies of days with rain, snow, hail, frost and thunder are tabulated. A comparison is made between the general monthly rainfall serial values calculated for England and Wales and data derived from the diary. The record of the aurorae observed is given. *Subject Headings:* **1. Historic weather records 2. Weather diaries 3. Precipitation frequencies 4. Auroral observations 5. Anglesey, Wales.**—*Author's abstract.*

10.1–65 551.501.1:551.515.4(09)

Baliles, M. (*Off. of Climatology, U. S. W. B., Wash., D. C.*), **History of observational instructions as applied to thunderstorms.** *U. S. Weather Bureau, Key to Meteorological Records Documentation,* No. 3.12, **1958.** 11 p. **DWB** (M09 U587k)—The detailed history of instructions for entering notes regarding thunderstorms in the climatological records of the U. S. W. B., especially in Form 1001 (first order station record, from 1891–1948), Form 1130 (airways observation record from 1928–1944) and Form WBAN-10 (1949–1957). History of Circular N (Instructions for Airway Observers, from 1928–1949 and Manual of Surface Observations from 1949–date) is outlined. *Subject Headings:* **1. History of U. S. W. B. climatological records 2. Instruction for observers 3. Thunderstorm records.**—*M.R.*

10.1–66 551.501.1:551.524(09)

Baliles, M. D. and Hagarty (*Off. of Climatology, U. S. W. B., Wash., D. C.*), **History of observational instructions as applied to temperature recordings.** *U. S. Weather Bureau, Key to Meteorological Records Documentation,* No. 3.10, **1957.** 7 p. Price: $.05 from U. S. Govt. Print. Off. **DWB** (M09 U587k)—The history of temperature corrections to thermometers used by the U. S. W. B. since 1881 is given in detail (for nonrecording thermometers). Instructions issued in 1894, 1905, 1935, 1939, 1944 and 1949 are cited. Instructions for reading maximum and minimum thermometers from 1897–1948, for reading thermometers to tenths (1896, 1952) and for times of setting maximum and minimum thermometers (1891–1951) are also given. *Subject Headings:* **1. Instruction for observers 2. History of U. S. W. B. climatological records 3. Temperature records.**—*M.R.*

10.1–67 551.501.1:551.577.37(09)

Hagarty, J. H. (*Off. of Climatology, U. S. W. B., Wash., D. C.*), **Excessive precipitation techniques.** *U. S. Weather Bureau, Key to Meteorological Records Documentation*, No. 3.081, **1958.** 12 p. tables, forms. **DWB** (M09 U587k)—The history of instructions to U. S. W. B. stations for computing "excessive precipitation" (i.e., precipitation of >1.00″ per hour or 2.50″ in 24 hrs) from 1896 to date is given and the detailed techniques given (with examples) for computing rates at different periods in the history of the U. S. W. B. The first such detailed instructions appeared in 1904, although mention was made of excessive precipitation in records as far back as 1896. Evaluation of both tipping bucket and weighing rain gage records are treated for intervals of 5, 10, 15, 20, 30, 45, 60, 80, 100, 120, 150 and 180 min. *Subject Headings:* **1. History of U. S. W. B. climatological records 2. Excessive precipitation records 3. Climatic records 4. Instruction for observers.**—*M.R.*

10.1–68 551.506:551.58(09)

Hagarty, H. J. (*Off. of Climatology, U. S. W. B., Wash., D. C.*), **History of climatological record books: a summary of the material recorded in Climatological Record Books maintained at first-order Weather Bureau Stations, 1870 to date.** *U. S. Weather Bureau, Key to Meteorological Records Documentation*, No. 2.210, **1957.** 10 p. **DWB** (M09 U587k)—All first order U. S. W. B. stations maintain permanent climatological record books giving detailed mean or extreme or frequency data on pressure, temperature, relative humidity, precipitation, snow, snow depth, wind, weather (sunshine, cloudiness, fog, hail thunder, auroras); daily means of temperature, total precipitation and snow, mean hourly pressure, temperature and wind speed, prevailing wind direction, hourly sunshine, etc. The record comprises one volume for the years 1871–1910, one for 1911–1930, one for 1931–50 and one for 1951–70. The list of stations (about 313) and available volumes at each is appended. Records for closed stations are maintained at the National Weather Record Center at Asheville, N. C. *Subject Headings:* **1. History of U. S. W. B. climatological records 2. U. S. Weather Bureau climatological networks.**—*M.R.*

BIOGRAPHY

10.1–69 551.5:92

Retirement of John Glasspoole, *Meteorological Magazine*, London, 87(1030):120–121, April **1958. DWB, DLC**—John Glasspoole retired from the Meteorological Office on Dec. 31, 1957 after 38 years service. Started with British Rainfall Organization in 1916 and was taken over by the Air Ministry Meteorological Office in 1919, awarded M.Sc. and Ph.D. at Univ. of London in 1922 and 1925 for his series of studies on the rainfall distribution of the British Isles. He worked with the Climatological Division until July 1957, and published many papers on the climatology of the British Isles, some of the best known in collaboration with C. E. P. Brooks. *Subject Headings:* **1. Biography of John Glasspoole 2. Glasspoole, John.**—*M.R.*

10.1–70 551.5:92

Grigor'eva, A. G., **A. V. Voznesenskiĭ, klimatolog, geograf.** [A. V. Voznesenskiĭ, climatologist and geographer.] Leningrad, Gidrometizdat, **1954.** 43 p. port., figs. **DLC** (QC858.V68G7)—Arkadiĭ Viktorovich Voznesenskiĭ, climatologist, hydrologist, seismologist and geographer was born in 1864 at Udobnoĭ in the Batalpashinsk Dept. of the Kubansk Oblast, and was raised on an island in the S.E. Caspain Sea. He attended St. Petersburg Univ. in the natural science division of the physical-mathematical faculty where he studied under and was influenced by Mendeleev. His thesis (1887) was on solar heat. In 1889 he began work at the Main Physical Observatory, in 1890 became senior observer at the Tiflis Physical Observatory which was establishing a meteorological network in the Caucasus. He set-up a precipitation network and wrote a treatise on the climate of the Caucasus. In 1894 he became director of the Irkutsk Observatory and studied the climate of the region and the hydrology of Lake Baikal. He held many other positions and published hundreds of works on climate of Siberia, the Urals, Crimea, Steppes, etc. He died on March 31, 1936. *Subject Headings:* **1. Biography of A. V. Voznesenskiĭ 2. Voznesenskiĭ, Arkadiĭ V.**—*M.R.*

BIBLIOGRAPHY

See also: **Sferics bibliogs.** (Sullivan et al.), 10.1–27; **Local forecast study bibliogs.** (Larson), 10.1–99; **Hurricane movement forecasting** (Hoover), 10.1–169; **Bibliog. of the works of C. E. P. Brooks,** p. 99.

10.1–71 551.582.3:016(43)

†Creasi, Vincent J. and Wallace, J. Allen, Jr., **Bibliography of climatic maps of Germany.** Wash., D. C., U. S. Weather Bureau, March **1958.** 42 p. 88 sources or refs. **DWB** (M(016) U587beg)—Annotated references are presented for 88 climatic maps or atlases of East and West Germany, arranged by 10 year periods: 1950–1957, 1940–49, 1930–39, 1920–29, 1910–19, 1900–1909 and prior to 1900. An alphabetical author and subject and a classified subject index are appended. The latter shows the approximate period covered by each source. Besides general charts, charts of frost, thunderstorm, radiation, temperature, pressure, wind, upper air wind, humidity, evaporation, fog and mist, cloud, precip., snow, hail, climatic types, hydrometeorology and phenology are included. Some of the annotations are brief, some are quite detailed. *Subject Headings:* **1. Bibliography on climatic charts of Germany 2. Climatic charts of Germany 3. Germany 4. East Germany.**—*M.R.*

10.1–72 551.582.3:016(265)

†Bender, Thomas A., Jr. and Vitale, Charles S. (*both, Foreign Area Section, Office of Climatology, U. S. W. B.*), **Selected bibliography of climatic maps for the Western Pacific Ocean.** Wash., D. C., May **1958.** 23 p. 47 titles. **DWB** (M(016) U587eL)—The fifty-odd references to climatic maps published from 1920–1957 are adequately annotated as to area, period, elements covered and sources. Area is bounded by and includes the Caroline, Mariana, Marshall and Palau Islands, Wake and Marcus. An area, author, subject and chronological (date of publ.) index is included. *Subject Headings:* **1. Bibliography on climatic charts of Western Pacific 2. Climatic charts 3. Western Pacific.**—*M.R.*

10.1–73 551.582.3:016(265)

†Vitale, Charles S. and Bender, Thomas A., Jr. (*both, Foreign Area Section, U. S. W. B.*), **Selected bibliography of climatic maps for the Southwest Pacific Ocean.** Wash., D. C., May **1958.** 28 p. 64 titles. **DWB** (M(016) U587se)—The 64 items, dating from 1910–1955 are adequately annotated as to contents or nature of the climatic charts. The bibliography is indexed by area, publication date, subject and author. The area includes the Admiralty Islands, Bismarck Archipelago, the Ellice, Fiji, Friendly and Gilbert Islands, New Britain, New Caledonia, New Guinea, New Hebrides, New Ireland, Palau, Samoa, Santa Cruz, Solomon and Tobriand Islands. *Subject Headings:* **1. Bibliography of climatic maps for S.W. Pacific 2. Climatic charts 3. Southwest Pacific.**—*M.R.*

PRACTICAL AND APPLIED METEOROLOGY

OCEANOGRAPHY AND MARINE METEOROLOGY

See also: **WMO Maritime Met. Commission, Hamburg** (Langlo), 10.1–47; **Moisture damage to cargoes** (Canfield), 10.1–113; **Microseismic waves, Casablanca** (Gelci, Cazaie), 10.1–269; **Seasonal chlorinity and variations of Kuroshio Current** (Moriyasu), 10.1–257; **Temperature and salinity distributions, Baltic Sea, Kiel Bay and Gulf of Finland** (Wüst et al.), 10.1–258; **Radiative exchange and ocean currents, Indian Ocean** (Albrecht), 10.1–259; **Wind stress on water** (Deacon), 10.1–270.

10.1–74 551.46

†Charnock, H. (*Natl. Inst. of Oceanog., Wormley*), **Physical oceanography.** *Science Progress,* London, 46(183):487–501, July **1958.** 4 figs., 26 refs., 5 eqs. **DLC**—A review of the most recent advances in physical oceanography; especially wind generated water waves, wind and wave spectra, wave generation by normal pressures, the role of ripples, the spectrum of longer waves, observed spectra of longer waves, observations at short fetch and initial generation of waves. Illustrative data are taken from both laboratory (under controlled

conditions) and ocean observations where many difficulties and complications exist. Inland lakes provide a happy compromise for testing theory. *Subject Headings:* **1. Physical oceanography reviews 2. Physical oceanography advances.**—*M.R.*

10.1–75 551.463:534.2(261.3)

Hela, Ilmo (*Inst. of Marine Res., Helsinki*), **The sound channel of the Baltic Sea.** *Geophysica*, Helsinka, 5(4):153–161, **1958.** 8 figs., 10 refs., 5 eqs. **DWB, DLC**—The annual march of the vertical distribution of the speed of sound in the Baltic Sea is analyzed. It is stated that between April and Oct. all the sounds in the Baltic Sea are refracted away from the surface layer, while in Dec. until Feb. the sounds can be heard also at the surface. The channel of the Baltic is found to appear very close to the surface in March, it sinks slowly during the summer months, and disappears in Nov. at a depth of some 100 m. *Subject Headings:* **1. Sound velocity 2. Sound transmission in sea water 3. Baltic Sea.**—*Author's abstract.*

10.1–76 551.46(261.3)

*Schulz, Bruno, **Hydrographische Untersuchungen in der Ostsee 1925 bis 1938 mit dem Reichsforschungsdampfer "Poseidon."** [Hydrographic research in the Baltic Sea, 1925–1938, with the government research ship "Poseidon."] *Deutsche Hydrographische Zeitschrift, Ergänzungsheft, Ser. B*, Hamburg, No. 1, **1956.** 87 p. almost entirely tables. 8 charts (in color, folded, at end). **DWB**—A compilation of data at various depths from numerous oceanographic stations, including temp., salinity, density, oxygen, alkalinity, phosphate and pH for 10 cruises of the research vessel "Poseidon" between April 1925 and Oct./Nov. 1938 in the Baltic (West Arkona and Bornholm Basins). The summarization was compiled early in 1944, but the author, Bruno Schulz, died in May 1944 and the manuscript of the text was lost. The charts and tables were saved and are here reproduced without change. The large colored "depth" charts are very nicely reproduced. *Subject Headings:* **1. Oceanographic cruise data 2. "Poseidon" cruises (1925–1938) 3. Western Baltic. I. Kalle, K.**—*M.R.*

10.1–77 551.465

Jolas, P., **Sur le calcul approché de la hou'le irrotationnelle.** [Approximate calculation of the irrotational surge.] *Académie des Sciences, Paris, Comptes Rendus*, 246(11):1659–1661, March 17, **1958.** 5 refs. **DLC**—The author explains by elementary means the Stokes formulas used for the approximate calculation of the plane, periodic, irrotational, permanent wave of small amplitude. The properties indicated by Struik are thus found in a direct way; and one connects several results obtained by Daubert, Peney and Price to the same reasoning. *Subject Headings:* **1. Stokes' wave 2. Ocean wave theory.**—*A.V.*

10.1–78 551.46.018

Cot, Pierre D., **Mesure des efforts exercés par les lames sur les ouvrages maritimes.** [Measurement of the stress of waves on maritime installations.] *Académie des Sciences, Paris, Comptes Rendus*, 246(5):806–808, Feb. 3, **1958. DLC**—Description of a device recording the might of waves, and allowing transmission at distance. Results obtained at Le Havre. *Subject Headings:* **1. Wave stress measurement 2. Oceanographic instruments.**—*A.V.*

10.1–79 551.556.8

Miller Arthur R. (*Woods Hole Oceanog. Inst., Woods Hole, Mass.*), **The effects of winds on water levels on the New England Coast.** *Limnology and Oceanography*, 3(1):1–14, Jan. **1958.** 8 figs., 7 refs., eqs. **DWB**—Tidal records from Nantucket Sound, Cape Cod; Montauk, Long Island; and Portland, Maine, have been studied along with wind and barometric observations from each location. Results of this study show that departures from mean sea level due to wind may be resolved into two components. The first is a component which refers to symmetrical sinusoidal variation of sea level departure as a function of wind direction and applies to the outer coast and to the general level of Nantucket Sound in particular. The second is an asymmetrical component which refers the responses of sea level at each observing station to local wind force, direction, fetch length, and local topography. Under different circumstances these components vary in relative importance in determining the local de-

parture from mean sea level. In addition to wind direction and velocity, duration and size of wind field may determine whether one component is more important than the other. The varying importance of each component probably governs the time-lag between peak winds and maximum sea level departures which will vary from several hours to as much as twenty hours. *Subject Headings:* **1. Wind effects on sea level 2. New England Coast.**—*Author's abstract.*

10.1–80 550.46

Stommel, H. (*Woods Hole Oceanog. Inst., Mass.*), **Streaks of natural water surfaces.** *U. S. Air Force. Cambridge Research Center, Geophysical Research Papers*, No. 19:145–154, Dec. **1952.** figs., tables. **DWB**—According to experiments, extending over a full year on a 214 acre pond, the probability of streaks seems to increase with wind. Streaks originated in all cases over 10 mph. No relation was found to the thermal stability of the layer near the water level or to relative humidity. Observational data are given in detail. Author assumes that streaks are not of convective nature, but are confined to the uppermost layer as a surface tension phenomenon, affected by capillary waves. *Subject Headings:* **1. Water surface streaks 2. Water-air interface 3. Capillary waves.**—*A.A.*

10.1–81 551.46.018:531.32

†Jerlov, N. G. (*Fishery Board of Sweden, Gothenburg*), **The particulate matter in the sea as determined by means of the Tyndall meter.** *Tellus*, Stockholm, 7(2):218–225, May **1955.** fig., 4 tables, 18 refs., 11 eqs. **DLC**—The Tyndall scattering has been studied for different material occurring in the sea, such as minerogenic matter, calcareous matter, and some marine organisms. It is shown that the scattering is proportional to the total surface of the particles provided that they are larger than 2μ. This relationship is practically independent of the concentration. The size distribution of particles in marine waters is discussed with a view to estimate the amount of matter removable by sedimentation. *Subject Headings:* **1. Submarine optics 2. Particle size measurement in sea 3. Marine sediments.**—*Author's abstract.*

10.1–82 551.5(26) 551.509.59:629.12(265)

King, Thomas A., **Transoceanic routing of ships based upon meteorological forecasts.** *Society of Naval Architects and Marine Engineers, N. Y., Technical and Research Bulletin*, No. 4-1, Dec. **1957.** 23 p. charts. **DWB** (M:387 K548tr)—A detailed report on a partially controlled study of speed of 27 trans-Atlantic ship crossings during Jan. 1955–Feb. 1956, using the usual Great Circle Routes vs. using a route planned on the basis of individualized forecasts of meteorological and oceanographic conditions expected en route. Methods are described and illustrated and data for 12 individually routed passages appended. Large charts show details of several such passages compared with usual routes. Economies are analyzed in terms of time and fuel savings and other benefits such as reduced heavy weather damage, smoother passage, safety, insurance reduction, etc. It is stated that the savings of one demonstration alone paid for the cost of 27 such demonstrations. *Subject Headings:* **1. Marine meteorology 2. Transoceanic shipping forecasts 3. Meteorologically controlled ship navigation 4. North Atlantic. I. Allen, Louis.**—*M.R.*

HYDROLOGY

10.1–83 551.464

Saruhashi, K. (*Met. Research Inst., Tokyo*), **On the equilibrium concentration ratio of carbonic acid substances dissolved in natural water (A study on the metabolism in natural waters, Pt. 2).** *Papers in Meteorology and Geophysics*, Tokyo, 6(1):38–55, May **1955.** 4 tables, 9 refs., 7 eqs. **DWB**—It is of importance to study the behavior of carbonic acid substances dissolved in natural water in order to know the chemical properties of the water. Acidity or alkalinity method has been generally used for this purpose for a long time. But this method often leads to erroneous results. The author proposed that a better way is to determine first the amount of total carbonic acid, pH and temperature, and then to calculate theoretically the amount of H_2CO_3, HCO_3^- and $CO_3^=$ using equilibrium constants between them. However,

h a calculation is too laborious for every analyst, and therefore the author completed ples convenient for use containing calculated values of molar fractions of each carbonic d substance for different temperature and pH in fresh water and sea water. In these ples, one can find any necessary values of molar fraction when the total amount of carbonic d, temperature and pH of waters are given. By the use of this method, exact determination the amount of each carbonic acid substance in water is made possible. *Subject Headings:* **Chemical analysis of water 2. Carbonic acid substance calculations.**—*Author's abstract.*

GLACIOLOGY AND SEA ICE

See also: **Ice formation and properties** (Lutkovskiĭ), 10.1–25; **Ice shelves, Maud Land, Antarctica** (Swithinbank), 10.1–54.

10.1–84 551.583.3(4) 551.311.1

†Hoppe, Gunnar and Liljequist, Gösta H., **Det sista nedisningsförloppet i Nordeuropa och ss meteorologiska bakgrund.** [Course of the last glaciation in northern Europe and its teorological background.] *Ymer*, Stockholm, 76(1):43–74, **1956.** 5 figs., 40 refs. English mmary p. 73–74. (Pt. 1), Hoppe, Gunnar: **Inlandsisen och dess klimatologiska miljö,** 44–58. (Pt. 2), Liljequist, G. H.: **Meteorologiska synpunkter pa istidsproblemet,** p. 59–73. **WB, DLC**—In the first article **Inland ice and its climatological environment,** HOPPE discusses great detail, with the aid of maps and photographs, the origin of the last glaciation in the ountains of Scandinavia under conditions of prevailing westerly winds, the eastward move- ent of the ice condition and the ice divide towards the Gulf of Bothnia under the influence more frequent southeasterly winds associated with paths of the cyclone across central and stern Europe, and the regression slopes of the glaciation which are considered in detail, pecially the role of the Sarek regions. In **Meteorological viewpoint regarding the ice age oblem,** LILJEQUIST discusses, in the light of meteorological data obtained on the inland ice, ntarctica, Greenland, and Spitzbergen, the influence which extensive ice fields exert upon teorological conditions, theories of climatic change, the initiation and regression of the last e age as a result of changes in cloudiness in sub-tropical and tropical regions resulting from riation in the output of ultraviolet radiation from the sun. *Subject Headings:* **1. Glaciation Climatic changes.**—*I.L.D.*

10.1–85 551.311.11:551.526

*†Avsiuk, G. A., **Temperatura l'da v lednikakh.** [Temperature of ice in glaciers.] *Akamiia Nauk SSSR, Institut Geografii, Trudy*, 67:63–141, **1956.** 8 figs., 4 tables, bibliog. 139–141. **DLC**—Extensive measurements of temperature and ice thickness were carried t on the Karabatkak and other glaciers in the Tien-Shan mountains over a period of years. he results of these observations and data from the literature are presented. The paper cludes an analysis of data on the measurement of the temperature of ice and of glaciers, a scussion of the principal factors determining the temperature regime of ice and of glaciers, e recrystallization type of ice formation, the recrystallization infiltration type of ice forma- n, "cold" infiltration type of ice formation, "warm" infiltration type of ice formation, iltration congelation type of ice formation and types of temperature regimes of contemporary ciers such as dry-polar type, humid-polar type, humid-cold type, marine type and con- ental type. The world-wide distribution of contemporary glaciers with different tem- rature regimes of ice thickness is shown on a map. *Subject Headings:* **1. Ice temperatures Ice thickness 3. Glaciers 4. Tien Shan, U.S.S.R.**—*I.L.D.*

10.1–86 551.311.1:016

‡Field, William O., **Some aspects of glaciers and glaciology.** (In: **Dynamic North.** Wash., C., Technical Assistant to Chief of Naval Operations for Polar Projects, **1956.** Vol. 1, 8. 19 p., 81 refs., looseleaf.) **DWB**—History of glaciology, distribution of glaciers on th, classification, ablation, climatic changes, quaternary glaciation, current trends in ciers, and problems for future research are reviewed in the light of a thorough literature vey. *Subject Headings:* **1. Glaciology 2. Glaciology bibliographies.**—*M.R.*

SEISMOLOGY

See also: **Antarctic expeds. and seismic soundings** (Doyen), 10.1–56.

10.1–87 551.509.52:550.342

§Kishinouye, Fuyuhiko (*Earthquake Research Inst.*) and Shida, Isamu (*Yamagata Univ.*), **Tripartite observation of microseisms at Sakata.** *Tokyo. Univ. Earthquake Research Institute, Bulletin*, 34(4):301–306, Dec. **1956.** 6 figs., 3 refs. **DWB**—In Feb. 1956, the authors set up 3 temporary stations in the northern part of Sakata in Yamagata Prefecture. Instruments were designed by KISHINOUYE. Microseisms during a snowstorm came from the E. at 750 m/sec, period was 4.0 sec. Synoptic chart for Feb. 5, 1956, at time of storm, is presented. Strong winds prevailed off the coast of N.E. Japan, indicating that microseisms were caused by sea waves off the coast and were propagated along the sea bed to the land. Microseisms from 2 typhoons were also noted. *Subject Headings:* **1. Microseismic storm detection 2. Yamagata Prefecture, Japan.**—*M.R.*

10.1–88 550.34

†Choudhury, Ahmed (*Quetta Obs.*), **Etude des ondes séismiques dans quelques tremblements de terre profonds de l'Hindou-Kouch.** [Study of seismic waves in some deep earthquakes of the Hindu Kush.] *Annales de Géophysique*, Paris, 14(1):31–75, Jan./March **1958.** 12 figs., 12 tables, 2 refs., 13 eqs. French and English summaries p. 31. **DLC**—The use of isochronic pairs for determining epicenters is critically examined, particularly the maximum difference permissible between arrival times of ***P*** for both stations of each pair. The observed times of *P* differ somewhat from those given in the JEFFREYS-BULLEN tables. An anomaly in time of *sP* and *sS* is not only related to regionality in elastic properties, but also implies that *p* and *s* are generated at different points of the fault. A radial wave arriving between *P* and *pP* is explained. Two transverse waves, for which it is difficult to find an adequate interpretation, sometimes appear 4 sec and 20 sec after the beginning. *Subject Headings:* **1. Seismic waves 2. Isochronic pairs 3. Jeffreys-Bullen tables 4. Hindu Kush.**—*Author's abstract.*

GEOMAGNETISM

See also: **Geomagnetic data analysis, Sitka, Alaska** (Cain), 10.1–29; **Cosmic ray stations for IGY, Canada and U.S.S.R.**, 10.1–43.

10.1–89 550.372:550.83

Graf, A., **Über die Möglichkeit der Aufsuchung von Grund- und Salzwasserhorizonten vermittels induktiver geoelektrischer Methoden.** [On the possibility of determining ground and salt water horizons by inductive geoelectric methods.] *Beiträge zur Geophysik*, 64(1):23–82, **1954.** 45 figs., 4 refs., 75 eqs. **DLC**—Author discusses the calculation of the field inside and outside a ring current of given radius in horizontal or slightly inclined strata. The results are applied to the search for underground water near the surface (0–100 m) and to geophysical prospecting, including the discovery of salt water layers indicating the presence of oil in depths of 500–2000 m. *Subject Heading:* **1. Geoelectric prospecting.**—*C.E.P.B.*

10.1–90 551.510.535:621.396:550.38

Lepechinsky, Dimitri and Durand, Jeanne, **Sur les conditions de réflexion verticale dans l'ionosphère en présence des chocs et du champ magnétique terrestre. Cas de la couche E.** [Conditions of vertical reflection in the ionosphere as determined by collision frequency and by the earth's magnetic field. Case of the E layer.] *Académie des Sciences, Paris, Comptes Rendus*, 240(3):333–336, Jan. 17, **1955.** 4 figs., 2 eqs. **DWB**—Two types of vertical radio wave propagation are established, e.g., quasi-transversal and quasi-longitudinal propagation. The type of propagation depends on electronic density and inclination of the geomagnetic field. It is found that vertical propagation at Poitiers alternates between the two modes of propagation. *Subject Headings:* **1. Radio wave propagation 2. Geomagnetic effects.**—*G.T.*

ASTRONAUTICS—SATELLITE OBSERVATORIES

See also: **Space travel** (Mallan), 10.1–31; **Satellite obs.** (Shternfel'd), 10.1–32; **Aerial and rocket photography** (Schwidefsky), 10.1–145.

10.1–91 523.4:629.19

Clement, George H., **The moon rocket.** *Franklin Institute, Phila., Journal of the Franklin Institute Monographs*, No. 2:14–24, June 1956. 10 figs. **DWB**—Orbits and weight considerations of moon rockets are considered at some length. At present 950,000 lbs at takeoff would be required to get 650 lbs near the moon so that 50 lbs of scientific instruments could be landed safely to operate for a month or so. *Subject Headings:* **1. Astronautics 2. Moon rockets.**—*M.R.*

10.1–92 629.19:612

Strughold, Hubertus and Haber, Heinz, **Where does space begin: functional concept of the boundaries between atmosphere and space.** *Journal of Aviation Medicine*, 22:342–349, Oct. 1951. 24 refs., 5 eqs. (Reprinted in: U. S. School of Aviation Medicine, **Epitome of space medicine** [Reprints, 1950–1957], Article No. 15.)—In relation to manned rocket flight, "space" must be treated not as a topographical concept but on the basis of functions which the atmosphere has for man and craft. The functional definition of space, namely the supply of breathing air and climate, supply of a filter against cosmic elements, and the supply of mechanical support are treated from the medical aspects. The discussion covers the following: the psychophysiological effects of explosive decompression, the variation of time reserve with altitude, the boiling point of body fluids, the problem of "bottled" air, and the thermal relationships between craft and surrounding atmosphere in space; the variation of the physical characteristics of solar radiation in space including visible heat, ultraviolet, x-rays and radio waves; meteors in space; and the physical characteristics of weight and weightlessness. *Subject Headings:* **1. Space definitions 2. Physiological effects of space flight.**—*I.L.D.*

10.1–93 629.136.3:612

†Haber, Heinz (*Dept. of Space Medicine*), **Manned flight at the borders of space: the human factors of manned rocket flight.** *American Rocket Society, Journal*, 22:264–276, Oct. 1952. 7 figs., 2 tables, 19 refs., 5 eqs. (Reprint in: U. S. School of Aviation Medicine, **Epitome of space medicine** [Reprints 1950–1957], Article No. 18.)—The functional border between atmosphere and space is defined as a certain level above the ground at which the atmosphere fails as a supporting medium. The functions of the atmosphere are examined in their bearing on respiration, prevention of boiling of body fluids, absorption of heavy primaries of cosmic radiation, absorption of ultraviolet solar radiation, supplying of aerodynamic lift and drag, supplying of diffuse daylight, absorption of meteors, thermal interaction with craft and interference by air drag over long periods of time. The discussion is accompanied by tables showing the altitudes of the various functional borders and equilibrium temperatures of various materials in space and by graphs giving times of useful consciousness at various levels of space, biological effectiveness of radiation, zenith brightness at various levels of altitude and main characteristics of the aeropause. *Subject Headings:* **1. Manned rocket flights 2. Physiological effects of space flight 3. Space flight.**—*I.L.D.*

AERONAUTICAL METEOROLOGY

10.1–94 681.14:629.13

U. S. Lewis Flight Propulsion Laboratory, Cleveland, **Central automatic data processing system.** *U. S. National Advisory Committee for Aeronautics, Technical Note*, No. 4212, April 1958. 96 p. figs., photos, ref. **DWB** (629.1308 U585tn)—This series of papers describes a system that will automatically record as many as 300 pressures, 200 voltages, and 24 frequencies in as little as 30 sec to an accuracy of 0.15% or better of full-scale range. All information is digitized, encoded, and recorded on magnetic tape for automatic insertion into a high-speed, general-purpose digital computer. Provisions for recording computer program modification instructions are incorporated. The recorder may be connected to any of eight different test facilities, any four of which may be operating simultaneously. The system is in daily operation

on a 24-hr basis and has an operating history of more than 2 yrs. The computer accepts the encoded data produced by the recording system and automatically calibrates it, takes averages, forms ratios, and does terminal calculations such as mass flow, momentum, distortion numbers, drag coefficients, thrust, specific fuel consumption, and efficiency. This computer has been in operation for approximately 1 yr and enables the computed data to be returned to the test engineer the next day. *Subject Headings:* **1. Automatic computation methods 2. Data processing 3. Numerical analysis 4. Aeronautics.**—*Author's abstract.*

10.1–95 551.578.7:629.13

Pavely, T. A.; Harding, J. and Harper, W. G., **Hail damage to aircraft at nearly 30,000 feet on July 3, 1957.** *Meteorological Magazine*, 87(1027):23–25, Jan. **1958.** 2 photos. **DWB, DLC**—Two Meteor aircraft, flying (July 3, 1957) at 29,500 ft in route for Dijon, were S.S.E. of Beachy Head nearing the French coast when they encountered severe turbulence and hailstones "one inch to golf ball size." Both aircraft received damage consisting of denting of all leading edges and of battered noses; some of the larger depressions were approximately 6 to 8 in. The synoptic situation over N.W. Europe and the radar echoes recorded at the time of the hail damage are described. *Subject Headings:* **1. Hail damage to aircraft 2. Synoptic conditions for hailstorms 3. Hailstone size 4. Beachy Head, Eng.**—*I.L.D.*

10.1–96 551.542:629.13

Corwin, H. G., **Pressure pattern flight planning: a comparison of the time front method with the single average drift correction technique.** Presented at the 137th National Meeting, Amer. Meteorological Society, K. C., Missouri, June 10, 1955. *Trans World Airlines, Inc., Meteorological Technical Bulletin*, No. 55-5, July 25, **1955.** 4 p. 4 figs. **DWB**—Tracks covered by a theoretical long distance non-stop flight from Newfoundland to Ireland are constructed on an actual 500 mb chart by two pressure pattern flight planning techniques, the time-front method and the single average drift correction method. Flight times over the constructed tracks are compared with the time over the great circle course. *Subject Headings:* **1. Pressure pattern flying 2. North Atlantic.**—*Author's abstract.*

10.1–97 551.5:629.135(05)

Interavia: Review of World Aviation, Geneva, Vol. 9, No. 4, **1954.** Contents: Gallois, P. M., **Weather still counts,** p. 211–214. Fischer, A., **Flight cancelled,** p. 215–219. Reichelderfer, F. W., **Meteorological services and bad weather flying,** p. 220–223. Du Pasquier, Pierre, **Weather service for pilots,** p. 224–226. Bell, J. C. G., **Towards all-weather operation,** p. 228–229. Roberts, Chris, **Weather reporting by air,** p. 230–231. **The weather ships go on,** p. 232. **FIDO versus Po Valley fogs,** p. 233. **DWB**—This issue is devoted entirely to articles on navigation and landing aids, including weather and forecast service in U. S. and Europe, and all weather flying problems. Articles listed above are abstracted separately. *Subject Headings:* **1. Aircraft landing aids 2. Airways meteorological services.**—*M.R.*

10.1–98 551.582.1:551.515.8(66/67)

Welter, L. and Suraud, P., **Note sur la climatologie aéronautique en Afrique Occidentale et Equatoriale.** [Aeronautical climatology of West and Equatorial Africa.] *France. Météorologie Nationale. Monographies*, No. 8, Nov. **1957.** 7 p. 3 figs., 10 refs. **DWB**—Study based on a series of average precipitation charts of the Territories of French Africa, giving several interesting remarks concerning the aeronautical needs. These remarks are formulated in connection with the position and evolution of the northern intertropical front. *Subject Headings:* **1. Aeronautical climatology 2. Air masses and fronts 3. West Africa 4. Equatorial Africa.**—*A.V.*

10.1–99 551.509.5:629.13:016

†Larson, R. J., **Meteorological research from Panama to Buenos Aires: an abstract of Panagra's meteorological files.** Lima, Peru, Pan American-Grace Airways, Inc., Nov. 10, **1954.** 16 p. **DWB**—A bibliography with abstracts of about 75 local or general forecast studies (some objective and some synoptic or dynamic) made by Panagra meteorologists, mostly at Lima, Peru. The studies cover airports, air routes or areas in Argentina, Chile,

Bolivia and Lima and the Peruvian Coast classified as above. The bibliography was contained in a summary of research at Limatambo, 1939–1954, by M. E. Graves, 1954. *Subject Headings:* **1. Airways forecast studies 2. Local forecast bibliographies 3. South America. I. Graves, M. E.**—*M.R.*

10.1–100 551.513.2:551.557.5:629.13

Hawkes, Russell, **Science improves jet-stream navigation.** *Munitalp Foundation, Inc., N. Y., Occasional Paper* No. 0013, April 2, **1956.** unpaged. fig. **DWB**—Project "Jet Stream" of the U.S.A.F., jet stream identification by means of cloud observation (V. J. SCHAEFER), the temperature gradient system of locating jet stream while in flight (as used by BOAC), and the automatic (radar and computing) techniques being developed by the Air Force and Cook Research Laboratories, are reviewed in an article aimed at informing pilots and aeronautical engineers, etc., of progress in full utilization of the jet stream in aerial navigation. *Subject Headings:* **1. Jet stream navigation. I. Schaefer, V. J.**—*M.R.*

AGRICULTURAL METEOROLOGY

See also: **Climatic effects on grasses** (Mogileva), 10.1–33; **Spring frosts, Bergerac, France** (Arléry), 10.1–248; **Sukhovei wind effects on plants, Kuibyshev, U.S.S.R.** (Tsuberbiller), 10.1–266; **Moisture content of grain, Halle, Germany** (Hoffmann), 10.1–279; **Water balance of rice fields** (Sato, Funahashi), 10.1–320; **Rice field temps.** (Sato), 10.1–321 and 10.1–322; **Barley ecology, Maule, France** (Garnier), 10.1–332; **Rice culture** (Nakahara, Mitsutera), 10.1–333.

10.1–101 051.501.9:63

Potapov, O. A., **Agrometeorologicheskaia stantsiia okazyvaet pomoshch' sel'skomu khoziaĭstvu.** [Agrometeorological station renders aid to agriculture.] *Meteorologiia i Gidrologiia*, Leningrad, No. 2:43–44, **1958. DWB, DLC**—In 1956 the Tosnensk Machine Tractor Station (Leningrad Oblast) made an agreement with the North-West Administration of the Hydrometeorological Service whereby it bound itself to provide meteorological instruments in return for agrometeorological data. The agrometeorological station provides the collective farms with information on the conditions of growth for winter and spring crops. The meteorological observations aided the Machine Tractor Stations in carrying out various reclamation operations. Various other examples of cooperation are mentioned. *Subject Headings:* **1. Agricultural meteorology 2. Agrometeorological cooperation 3. U.S.S.R.** —*I.L.D.*

10.1–102 551.586.63:551.588.6

Geslin, H. (*France*), **Les plantes et le climat (Quelques aspects particuliers des buts et des méthodes de la bioclimatologie agricole).** [Plants and climate: some particular aspects of the aims and methods of agricultural bioclimatology.] *International Journal of Bioclimatology and Biometeorology*, Leiden, Holland, Vol. 2 (Pt. 2), **1958.** 22 p. 16 figs., 13 refs. **DWB**—The author points out that agricultural bioclimatology would have to depart from a certain empiricism to be considered a true applied science. He indicates that the principle of classical experimental method could be applied directly, in the state of the natural habitat, to study the relations between plants and climate. In the first part, the author explores the possibility of using the experimental method to the study of climate-plant relationships under natural conditions. This statement is based on results obtained by the author, who formulated the laws of action of temperature and global radiation. The second part deals with the problem of water, the heat-moisture complex and the feeding of plants in water (hydroponics). Agricultural bioclimatology, situated at the conjunction of different disciplines (physiology, ecology and climatology), constitutes an independant branch of science. *Subject Headings:* **1. Agricultural bioclimatology 2. Vegetation influences on climate.**—*A.V.*

10.1–103 551.509.59:63

Babushkin, L. N., **Nekotorye voprosy agrometeorologicheskikh informatsiĭ i prognozov.** [Problems on agrometeorological information and forecasting.] (In: Akademiia Nauk Uzbekskoĭ SSR. Institut Matematiki i Mekhaniki, **Meteorologiia i gidrologiia v Uzbekistane.**

Tashkent, **1955.** p. 79–83.) **DLC**—A general discussion of the problems and methods involved in assessing the effect of concomitant weather upon the development and condition of agricultural crops and phenological forecasts to predict the development and growth conditions of plants. The subjectivity, and hence inexactness, of phenological observations is compared with the objectivity and precision of meteorological observations and the differences in the quality of observations of the various developmental phases of plants render it difficult to obtain precise knowledge on the effect of weather upon plants. While a knowledge of the quantitative relationship between weather elements and plant phases allows quantitative prediction, the extrapolation of weather-plant relationships from one area to another introduces inaccuracies. However, it is not only important to evaluate the influence of weather upon plant development and to collect phenological data but the agrometeorologist must also demonstrate the correspondence between plant phase and weather and explain the failure of such an agreement to take place. Specific examples of such situations are discussed. The role of the agrometeorologist in agriculture, in forecasting, planning of crop schedules, etc. is considered. *Subject Headings:* **1. Agrometeorological forecasting 2. Weather effects 3. Phenological forecasting.**—*I.L.D.*

10.1–104 551.509.58:63

Bulinskaia, N. A., **Uchet pogody v obespechenii nuzhd sel'skogo khoziaĭstva.** [Consideration of weather in supplying agricultural needs.] (In: Akademiia Nauk Uzbekskoĭ SSR. Institut Matematiki i Mekhaniki, **Meteorologiia i gidrologiia v Uzbekistane.** Tashkent, **1955.** p. 187–193.) **DLC**—The problem of the utilization of weather forecasts is, broadly speaking, three fold: the precision of the forecasts both for short and long range, the interpretation and application of the forecast, and the absence of agreement between meteorologists and farmers on the solution of specific problems in the application of meteorology to agriculture. Thus weather forecasts are not always needed, since climatic characteristics may suffice, precise forecasts are often needed only for a single meteorological element and the most complex unplanned operations are determined by the general characteristics of seasonal weather. These general propositions are illustrated with specific examples, and the plan of work following therefrom is indicated. *Subject Headings:* **1. Agrometeorological forecasting 2. Specialized forecasts.**—*I.L.D.*

10.1–105 551.506.2:551.586:63

Geslin, H., **Aspects climatiques de la campagne agricole 1955–1956.** [Climatic aspects of the agricultural campaign 1955–1956.] *Académie d'Agriculture de France. Procès Verbal,* Jan. 30, **1957.** Reprint of 10 p. 6 figs., 2 tables.—Study of the influence of climatic factors on agricultural production during the year 1955–56. The uncommon character of the winter, and more especially of the month of Feb. 1956, caused serious damage to the crops. The cold weather of spring and summer resulted in remarkable yields in some cases; 50 quintals or thereabouts, which were realized that year with spring sowings. *Subject Headings:* **1. Agricultural bioclimatology 2. Climatic influences on agriculture 3. Climatic data 4. France.**—*A.V.*

10.1–106 551.556.3:621.311.24

*Ledács-Kiss, Aladár, **Szélenergia: a mezőgazdaság olcsó energiaellátása.** [Wind energy: inexpensive power supply for agriculture.] *Magyar Energiagazdaság,* Budapest, 9(7):273–278, July **1956.** 5 figs., table, refs. **DLC**—Construction details of low-output wind generators for water pumping and other uses in agriculture are discussed and illustrated. Wind requirements and energy balance of such units are discussed. A diagram showing annual frequencies of various wind speeds and corresponding theoretical useful energy is presented (Martonvásár experiment station). Suitable conditions for low-power wind generator operation are believed to exist throughout Hungary but special surveys are required to find the proper locations. *Subject Headings:* **1. Wind utilization 2. Wind generators 3. Hungary.**—*G.T.*

10.1–107 551.524.37:634.73

Cross, C. E. (*Res. Prof. in Charge, Cranberry Exper. Stat., E. Wareham, Mass.*), **Weather and cranberries in Massachusetts.** *U. S. Weather Bureau, Weekly Weather and Crop Bulletin*

43(47):7–8, Nov. 19, 1956. 3 refs. Also: Wolford, L. V. (*Off. of Clim., U. S. W. B., Wash., D. C.*), **Cranberry culture in the United States.** *Ibid.*, 43(51):7–8, Dec. 17, 1956. **DWB, DLC**—Low temperatures in the spring and fall bring about frost damage to the crops but night winds and clouds, during such seasons, are good for them. A frost-warning system has been adopted jointly by the Cape Cod Cranberry Growers Association, the U. S. Weather Bureau and the Cranberry Experiment Station. Wolford states that Massachusetts, Wisconsin, New Jersey and the Pacific Northwest are the major growing areas. Cranberries have poor adaptation to heat. Unusually high temperatures in May and June will cause field-rot. *Subject Headings:* **1. Frost damage to cranberries 2. Fruit frost warning systems 3. Cranberry culture 4. Massachusetts.**—*N.N.*

FOREST METEOROLOGY—FIRE WEATHER

See also: **Hurricane damage to forests, New England** (Spurr), 10.1–268; **Chem. composition of precip.** (Rougerie), 10.1–292.

10.1–108 551.579.1:551.584

Rougerie, Gabriel, **Existence et modalités du ruissellement sous forêt dense de Côte d'Ivoire.** [Existence and forms of the runoff in the dense forest of the Ivory Coast.] *Académie des Sciences, Paris, Comptes Rendus*, 246(2):290–292, Jan. 13, **1958.** 1 ref. **DLC**—The results obtained by measurements of qualitative and quantitative characters, systematically carried out since 1951 at 21 permanent research stations (17 in the forest and 4 in the Savannah), make it possible to conclude that the runoff phenomena and the resulting erosion in a tropical muggy forest setting are real. The presence of the forest cover does not prevent the runoff; its nature, combined with climatic, pedological and topographical factors, merely give a particular character to the runoff. *Subject Headings:* **1. Runoff 2. Forest meteorology 3. Ivory Coast.**—*A.V.*

10.1–109 551.579:551.588.6

†Wicht, C. L. and Schumann, D. E. W. (*both, Univ. of Stellenbosch, S. Africa*), **Experimental investigation of the effects of forests on stream discharge, with recommendations for statistical analysis.** (Paper presented at?) Commonwealth Forestry Conference Australia and New Zealand, 1957. pub. **1957.** 12 p. fig., table, 18 refs. **DWB**—Principle governing the adequate performance of experiments on whole catchment areas is discussed and a list of necessary observations is given. Then it is shown in what way a proper statistical analysis has to be made to give a valid comparison. No technical data are given. *Subject Headings:* **1. Catchment experiments 2. Forest hydrology 3. Union of South Africa.**—*A.A.*

10.1–110 551.586:595.76:634.94

*†Wild, Maria ((*Univ. Freiburg i Br.*), **Die Entwicklung des grossen Fichtenborkenkäfers *Ips typographus L.* im Hochschwarzwald (1000–1200 m ü. M.) und ihre Abhängigkeit vom Klima, 1947–1950.** [Development of the large spruce bark beetle *Ips Typographus L.* in the upper Black Forest, 1000–1200 m, and its dependance on climate, 1947–1950.] *Naturforschende Gesellschaft zu Freiburg i Breisgau, Berichte*, 43(2):121–176, 1953, pub. May **1955.** 11 figs., 23 tables, 46 refs. **DWB, DLC**—The development of the spruce bark beetle and the resulting damage depend considerably on the climatic conditions and even the local climatic peculiarities. These effects are investigated in detail. Ten to twenty thousand degree-hours above 7°C are necessary for the development of a new generation. Tree temperatures from 30 to 40°C are an optimum for the beetle, which is killed by temperatures above 47°C. Conclusions are substantiated by numerous data. *Subject Headings:* **1. Forest climatology 2. Spruce bark beetles 3. Forest entomology 4. Black Forest, Germany.**—*A.A.*

10.1–111 551.5:368.10

*Galzi, L., **Les incendies de forêts dans les Alpes-Maritimes en septembre 1957.** [Forest fires in the Maritime Alps in Sept. 1957.] *La Météorologie*, Paris, Ser. 4, No. 49:59–67, Jan./March **1958.** 3 figs., 3 charts, 3 tables. **DWB**—On Sept. 12th, 1957 ten fires were observed in the Maritime Alps. These fires continued until Sept. 16th and destroyed 1200 ha. For this period, the author gives the weather chart, the aerological diagrams and the general

atmospheric situation over the Northern Hemisphere. Not only are the warnings given by the meteorological office very useful, but the information given during the fire are more important because the protection against the fire is made, considering the forecast wind direction and velocity. After this experience it seems that, for editing the warnings, not only the meteorological elements at the station where the warning is made are to be taken into account, but also the value of these elements in the region. Warnings are to be given before the elements have reached their critical value, which means that the variation of the elements must be forecast during the day: increase of wind velocity and temperature, decrease of humidity. *Subject Deadings:* **1. Forest fires 2. Fire weather conditions 3. Maritime Alps, France.**—*A. V.*

INDUSTRIAL METEOROLOGY

See also: **Wind utilization, Hungary** (Ledács-Kiss), **10.1–106.**

10.1–112 551.58:6

Landsberg, H. E. (*Dir., Office of Climatology, U. S. W. B., Wash., D. C.*), **Industrial climatology.** *U. S. Weather Bureau, Weekly Weather and Crop Bulletin*, 43(26):7–8, June 20, **1956.** 2 tables, 2 refs. **DWB, DLC, DA**—Climatic whims and furies bear greatly on industries. J. A. Russell and collaborators of the University of Illinois present tables from their research on how normal industrial activities prevail within certain listed temperature and relative humidity limits. *Subject Heading:* **1. Industrial climatology.**—*N.N.*

10.1–113 551.571:656.6

Canfield, N. L. (*Natl. Weather Records Center, Ashville, N. C.*), **Moisture damage to ships' cargoes.** *National Conference on Applied Meteorology, Hartford, Connecticut, Oct.* 1957, *Proceedings*, issued **1957.** Section A: 19–26. 5 refs. **DWB** (M A512pro)—Damage from condensed moisture that forms either on ships' inner structures or on the cargo itself, produces losses in millions of dollars annually. Various approaches underway to meet the problem are briefly discussed. Greatest emphasis is placed on the meteorological aspects which center on: (1) effective psychrometric instrumentation and observations, (2) education of operating personnel on the basic physical principles of heat and moisture flow, and (3) weather systems and climatic regions that regularly aggravate the problem. *Subject Headings:* **1. Moisture damage to cargoes 2. Marine transport.**—*Author's abstract.*

10.1–114 551.556.6

Lightfoot, E. (*Dept. Civil Eng., Leeds Univ.*), **The analysis for wind loading of rigid-jointed multi-storey building frames, Pt. 1.** *Civil Engineering*, London, 51(601):757–759, July **1956. Pt. 2,** *Ibid.*, No. 602:887–889, Aug. **1956.** 7 figs., 3 tables, 7 refs. **DLC**—Architectural details of a procedure for solving the wind effect on a building frame by "principle of multiples" is described. Successive sway corrections are cumulated from a one bay to the actual or final multi-bay deformation. The method is compared with other methods which are more involved but which give better approximations under special cases. Several examples are worked out. *Subject Heading:* **1. Wind load on structures.**—*M.R.*

10.1–115 551.5:629.13:355

Courtney, F. E., Jr. (*Lockheed Aircraft Corp., Georgia Div.*), **Novel jobs in meteorology at Lockheed's Georgia Division.** *American Meteorological Society, Bulletin*, 38(9):543–546, Nov. **1957.** 4 figs. **DWB, DLC**—Meteorology is part of the Military Operations Research Engineering Division. The majority of the meteorological studies carried out at Lockheed concern the evaluation of advanced air-borne weapon systems (evaluation of air refueling systems, design and operation of nuclear powered aircraft systems, etc.). In addition, various short-time meteorological problems affecting various aspects of design, production and test programs are investigated. These include moisture content of air within pressurized aircraft at high altitudes, operational temperatures encountered in Polar air operations, etc. At the Georgia Nuclear Aircraft Laboratory a weather station provides meteorological data for the actual operational phase of the nuclear reactor. The operation of this station and its in-

rumentation are described. *Subject Headings:* **1. Military meteorology 2. Aeronautical eteorology 3. Georgia Nuclear Aircraft Laboratory.**—*I.L.D.*

10.1–116 551.556.81:639.2

Carruthers, J. N. (*Br. Nat. Inst. of Oceanog.*), **Fish, fisheries and environmental factors.** *eanus*, Woods Hole, Mass., 4(2):14–20, **1956. DLC** (uncat.)—Also issued as *National stitute of Oceanography, Wormley, Collected Reprints*, 4(133), **1956. DWB**—The importance wind conditions prevailing during spawning conditions in determining whether first broods ll grow up successfully is discussed. Within the consideration paid to wind, attention is ven not only to horizontal water movements but to other environmental elements contained the expression "total commotion." A brief account is given of the fish-wind associations tablished for different North Sea fish, the role of wind in providing currents, drifts with ological properties favorable to fish larvae (K. M. Rae, D. P. Wilson), the possible use of w artificial islands as sources of wind records, the possible causal interrelationships between mersal fish concentration and near-bottom currents, etc. *Subject Headings:* **1. Wind effects fish spawning 2. Wind driven currents 3. Fisheries 4. North Sea.**—*I.L.D.*

10.1–117 551.556.6:69

American Standards Association, **American Standard Building Code requirements for inimum design loads in buildings and other structures. Sponsor, National Bureau of andards.** Approved Sept. 3, **1955.** 29 p. figs. **DWB** (692.9 A512am)—Minimum design iteria for dead loads, live loads, soil and hydrostatic pressure, wind and earthquake loads are t forth concisely, with maps and tables. Wind loads on walls, roofs, chimneys, tanks and wers, signs, etc. are treated in Ch. 5 (p. 10-12). Outward pressure, inward pressures, pressures erted at various heights above the ground (to >1200 ft) for different pressure areas are also scussed. A map of U. S. showing these wind pressure areas, and one showing estimated eight of seasonal snowpack exceeded one year in ten are included. *Subject Headings:* **1. Wind ad on structures 2. Design load on structures 3. Snow load on buildings 4. United ates.**—*M.R.*

MEDICAL METEOROLOGY

10.1–118 551.586:616.12

Burch, G. E. and Hyman, A., **Increase in cardiac output and work on normal man and of tients with chronic congestive heart failure produced by a hot and humid environment.** *ternational Journal of Bioclimatology and Biometeorology*, Leiden, Vol. 1 (Pt. 4, Human oclimatology), **1957.** 3 p. 2 tables, 7 figs., 6 refs. **DWB**—The cardiac output of 7 adults, controls and four with congestive heart failure, was measured by catheterization of the right le of the heart and by the Fick method with the subjects at 78°F and 60% relative humidity d at 111°F and 80% relative humidity. The cardiac output and stroke volume were in- eased in all subjects; the increase being greatest in the control subject (5 to 20 l/min); and in e patients with chronic congestive heart failure the mean increase was 5 to 10 l/min. The essure volume course-curves and time-curves of accumulated work and of tension in the lls of the ventricles show a higher pressure with ejection of less blood per cardiac stroke, ess efficient increase in the work of the ventricles and a greater increase in the tension of the ntricular walls with less ejection of blood volume per stroke in the patients with congestive art failure than in the normal subjects. Numerical data on the arterial blood pressure and ht ventricular pressure and respiratory parameters as well as graphs of cardiac performance e presented. *Subject Headings:* **1. Temperature effects on heart disease 2. Heart disease Hot humid climate effects.**—*I.L.D.*

10.1–119 551.586:616.853

*†Sal y Rosas, F. (*Peru*), **Geographical locality and convulsive susceptibility of epileptic tients.** *International Journal of Bioclimatology and Biometeorology*, Leiden, Vol. 1 (Pt. 4, iman Bioclimatology), **1951.** 14 p. 7 figs., 5 tables, 118 refs. **DWB**—On the basis of an tensive study of the incidence of epilepsy in Peru and of comparative studies of its incidence other parts of the world, the author propounds the theory that climate exerts a "possible

remote and permanent effect upon convulsive disposition making the autochthonous inhabita more or less receptive to convulsive agents." Material is presented showing a comparison the convulsive susceptibility of Peruvians with those of countries in temperate zones, and highland with lowland Peruvians. The threshold of convulsions was found to be lower amo the inhabitants of Peru than among those of Europe and the U. S., and lower among tho inhabiting the coast than among those inhabiting the Sierra. The frequency of epileps seems to be higher in Peru than in countries with a temperate climate and is also higher on t Peruvian coast than in the Sierra. The conclusion is drawn that convulsive susceptibili increases as geographical latitude and altitude decrease. Extensive statistical data on i cidence of epilepsy are presented. *Subject Headings:* **1. Epilepsy 2. Climatic effects epilepsy 3. Geographical distribution of epilepsy 4. Altitude effects on epileptic susceptibili 5. Peru.**—*I.L.D.*

10.1–120 551.586:612

*Schulze, Alfred, **Der Jahresgang der Schwüle in Afrika.** [Annual variation of sultriness Africa.] *Geographisches Taschenbuch*, Jungingen, Hohenzollern, **1957/1958**:270–273. 3 figs table, 4 refs. **DLC** (G72.G4)—A map of Africa shows the regional extent of seasonal occurren of the most sultry month of the year. A series of curves and a table give the average month degree of "thermal sultriness" (in °C) according to SCHARLAU's definition for 3 stations on t west coast, 1 on the north coast, 2 in the interior, 1 on the south and 3 on the east coast Africa. The chart is being published in color in: Rodewald, E., **Welt-Seuchen-Atlas II Te** [World atlas of epidemic diseases, Pt. 2], published by Falk-Verlag, Hamburg. The sultrine scale is based on a limit of 14.08 mm Hg as the aero value for sultriness: a negative valu indicating sultry and a positive value tolerable conditions. *Subject Headings:* **1. Sultrines 2. Annual sultriness regime 3. Africa.**—*M.R.*

METEOROLOGICAL OBSERVATIONS AND INSTRUMENTS

METHODS OF OBSERVATION

See also: **Handbook of geophysics** (Geophys. Res. Directorate, 10.1–3; **Aerostat soundings, Moscow** (Deviatova), 10.1–14; **Radio teletype noise** (Sullivan et al.), 10.1–27; **Geophysical obs., Monte Capellino, Italy** (Bossolasco, Dagnino), 10.1–61; **Thunderstorm and climatological records, U. S. W. B.** (Baliles), 10.1–65; **U. S. W. B. climatological records** (Baliles), 10.1–66; **U. S. W. B. excessive precipitation records** (Hagarty), 10.1–67; **Agricultural meteorology, U.S.S.R.** (Potapov), 10.1–101; **Hurricane reconnaissance instrumentation** (Hilleary, Christensen), 10.1–158; **Radar precip. study** (Lhermitte), 10.1–161; **Advection and computation tables** (Dahler), 10.1–197; **Atmosphere structure and ionospheric winds** (Delobeau), 10.1–271.

10.1–121 551.5

Dady, G., **Le calcul automatique en météorologie.** [Automatic calculation in meteo ology.] *La Météorologie*, Paris, Ser. 4, No. 48:493–501, Oct./Dec. **1957.** 3 figs. Frenc English and Spanish summaries p. 493. **DWB**—The author outlines the needs of Fren Meteorology in automatic calculation and briefly describes the logical organization of electronic calculator which is being constructed to meet them. *Subject Headings:* **1. Automat calculation 2. Electronic calculators.**—*Author's abstract.*

10.1–122 551.501:551.578.

Furukawa, Iwao and Kuroda, Masao (*both, Scientific Research Inst., Tokyo*), **Measureme of water content in snow.** *Researches on Snow and Ice*, Tokyo, No. 2:1–9, Jan. **1955.** fig table. In Japanese. **DWB**—A survey of studies of measurement of water content by t calorimetric, volumetric, centrifugal, electrical and other methods from 1936–1954 in Japa Cautious procedures with the calorimetric and three different types of Japanese centrifug separator using di-ethyl aniline or gasoline are discussed. A comparative study of centrifug water-content separation with and without insulation shows that nonadiabatic (without ins

tion) method does not indicate general applicability except in a few limited cases. A rough aph showing the relation between shear resistance (gr/cm) and density of deposited snow 5 different water contents ranging from 0 to 20% is given. *Subject Headings:* **1. Water ntent of snow 2. Water content recorders 3. Japan.**—*J. H. Woo.*

10.1–123 551.501:551.510.42

Gruber, Charles W. and Jutze, George A., **The use of sticky paper in an air pollution onitoring program.** *Air Pollution Control Association, Journal*, 7(2):115–117, August **1957.** tables. **DWB, DLC**—The Cincinnati Bureau of Air Pollution Control presents a 1955 mparative Sticky Paper Survey. Large particles are 5μ and can individually be observed ith well-lighted magnification of about 14×. Considering particles collected in 8 zones of e city during the average dirtiest and cleanest weeks downtown, the total particles/wk/8 in.^{2} all directions was 77,900 more than that collected in the residential area, and the max fall rticles/in.^{2} was 14,300 more in the downtown section than in the residential. *Subject Head-gs:* **1. Atmospheric pollution measurement techniques 2. Cincinnati, Ohio.**—*N.N.*

10.1–124 551.501:551.550

Scott, J. R. (*Malayan Met. Service, Singapore*), **An essay on low-latitude wind analysis.** *oyal Meteorological Society, Quarterly Journal*, 84(360):166–171, April **1958.** 3 figs., 13 refs., is. **DWB, DLC.** Comment by C. E. Palmer in *Ibid.*, 84(361):286–287, July **1958.**—A ethod of wind analysis widely used in low latitudes is shown to be basically unsound, using ie results of another method of analysis. It is shown that analogy may usefully be drawn etween middle-latitude and equatorial airflow. A suggestion for the use of pressure data ear the equator and brief comments on well-known types of wind analysis are made. The nphasis is on equatorial conditions. *Subject Headings:* **1. Wind analysis 2. Low latitude inds.**—*Author's abstract.*

10.1–125 551.501.7:551.557:551.510.535

Lejay, P., **La mesure des vents ionosphériques.** [Measurement of ionospheric winds.] *cadémie des Sciences, Paris, Comptes Rendus*, 245(3):253–257, July 17, **1957.** 4 refs. **DLC**—easurement of ionospheric winds based on the method of three receivers (Domont) is given. hree antennae have been erected at the summits of a right-angled triangle, the small sides which develop a length of about 200 m and are oriented nearly North-South and East-West. he three receivers magnify the echoes, received after reflection on the ionosphere, of the gnals of an impulse emitter (1 KW crest, settled on 3,4 MHz) adjoining the receivers. The corded electronic displacements could possibly be explained to be in relationship with the ectrical streams susceptible to clear the diurnal changes of the Earth's magnetic field. It ems, however, that a wave dephasing of 2 to 3 hrs should exist in the way of an advance the registered directions on the directions forecast by the magneticians. The author points it that seasonal change of ionospheric wind directions does not exist. *Subject Headings:* **Measurement of ionospheric winds 2. Seasonal changes 3. Domont, France.**—*A. V.*

10.1–126 551.501.7:551.508.822

Sinha, K. L., **Determination of the rate of ascent of the large radiosonde-rawin balloons om the value of the coefficient of aerodynamic resistance.** *Science and Culture*, Calcutta, 2(12):684–686, June **1957.** table, 16 refs., 5 eqs. **DLC**—A table showing the values of the te of ascent of radiosonde-rawin balloons calculated from an equation based on LAMB and HAW for aerodynamic resistance, etc. assuming Reynolds numbers of 8 to 10×10^5, compared ith ascension rates from radiosonde records, gives very close agreement. *Subject Headings:* **Radiosonde ascension rates 2. Aerodynamic resistance of radiosonde balloons.**—*M.R.*

10.1–127 551.501.721:551.521.3

Bonnet, G., **Considérations sur la mesure du rayonnement diffusé en actinométrie.** Considerations about diffuse radiation measurement in actinometry.] *Journal Scientifique de Météorologie*, Paris, 9(36):155–157, Oct./Dec. **1957.** 2 figs., 2 refs. French, English and

Spanish summaries p. 155. **DWB**—The author publishes his observations on the value of actinometric measurement bearing on diffuse radiation, a value depending from the incidence angle of the ray. He analyzes the hemispheric ray received on a flat receiver in 3 equidistant zones of 30° and takes into consideration the type of the sky or the cloudiness at the time of measurement. *Subject Headings:* **1. Diffuse radiation 2. Actinometric observation techniques 3. Cloudiness 4. Lwiro, Belgian Congo.**—*Author's abstract.*

10.1–128 551.501.724:551.508.2

Petit, M., **L'utilisation des thermistances en thermométrie.** [The use of thermistors in thermometry.] *Journal Scientifique de la Météorologie*, Paris, 9(35):93–102, July/Sept. **1957.** 6 figs., 2 tables, 6 refs. **DWB**—Thermistors can be used for precise measurements of temperature, provided certain conditions of use are respected. Two mountings are indicated which allow the linearization of their readings according to temperature. The first mounting indicated by the author is the linearization by a shunt, the second being the linearization by a potentiometric bridge. This last method permits a better linearization on much more extended areas, and gives the advantage of being easily recorded in a classical method by a servopotentiometer. The author introduces this work by notes on thermal dissipation, on inertia and on sensitivity of thermistors. *Subject Headings:* **1. Temperature measurements 2. Thermistors.**—*A. V.*

10.1–129 551.501.7

Reiter, Elmar R. (*Innsbruck Univ., Austria*), **An aid for accurate wind plotting.** *American Meteorological Society, Bulletin*, 38(10):617–618, Dec. **1955.** 3 figs., ref. **DWB, DLC**—The upper air wind plotting aid is constructed of two transparent lucite rings, held together by four stub-nails with round heads for easy moving on a chart without smearing the ink. Arrows for wind direction and speed (or barbed arrows) may be plotted with ease and accuracy. The device was devised by the author and built at the Hydrodynamics Lab. of the Dept. of Meteorology of Chicago Univ. *Subject Heading:* **1. Wind plotting aids.**—*M.R.*

10.1–130 551.501.81:551.57

Braham, Roscoe R., Jr. (*Univ. of Chicago*), **Cumulus cloud precipitation as revealed by radar-Arizona 1955.** *Journal of Meteorology*, 15(1):75–83, Feb. **1958.** 8 figs., 7 tables, 2 refs. **DWB, DLC**—An AN/TPS-10 radar, located at the Institute of Atmospheric Physics, University of Arizona, has been used to make extensive measurements of radar returns from cumulus clouds in the vicinity of Tucson. Data from ten days in the summer of 1955 have been analyzed with a view toward establishing the level of first formation of precipitation, day-to-day variation, average dimensions of first echo, average duration, and fraction reaching ground. Strong day-to-day variations and mountain effects are revealed. Although echoes form much more frequently over mountains than over nearby valleys, these echoes individually are less likely to produce rain at the ground. *Subject Headings:* **1. Radar echoes from cumulus clouds 2. Precipitation variations 3. Tucson, Ariz.**—*Author's abstract.*

10.1–131 551.501.83:551.594

Chapman, J. (*Courtlaud's Ltd., Coventry*), **The waveforms of atmospherics and the propagation of very low frequency radio waves.** *Journal of Atmospheric and Terrestrial Physics*, London, 11(3/4):223–236, **1957.** 14 figs. (incl. photos), 25 refs., eqs. **DLC**—Experimental observations upon atmospherics by several techniques are described. It is shown, in particular, that the results obtained for wave forms and for frequency spectra can be interrelated. The frequency spectrum of the electromagnetic disturbance at the source—the lightning discharge—is considered, and evidence is presented indicating appreciable differences, in this respect, between individual flashes. The interpretation of the results, on the basis of wave-guide theory, applied to the space between the earth and the lower ionosphere, is considered; this approach is entirely successful qualitatively, but quantitatively the agreement is less satisfactory. *Subject Headings:* **1. Sferics wave forms 2. VLF radio wave propagation.**—*Author's abstract.*

10.1–132 551.501.83

Hepburn, F. (*Physics Dep., Univ. of Nottingham*), **Classification of atmospheric wave-rms.** *Journal of Atmospheric and Terrestrial Physics*, London, 12(1):1–7, **1958.** 3 figs., refs. **DLC**—The desirability and requirements of a systematic classification of atmospheric ave forms are discussed. An observational scheme is suggested and interpreted in terms of nown properties of the discharge and propagation mechanisms. This data is reviewed to arify application of the scheme to individual wave forms. The relationship of the classifica-on to previous inadequate groupings is indicated. *Subject Headings:* **1. Sferics wave forms Sferics classification.**—*Author's abstract.*

10.1–133 551.501.83:551.594.221

Horner, F. and Clarke, C. (*both, Radio Res. Station, Dept. of Scient. and Indust. Res.*), **adio noise from lightning discharges.** *Nature*, London, 181(4610):688–690, March 8, **1958.** figs., 2 refs. **DWB**—During a storm on July 19, 1957 the Radio Research Station, Slough, btained records of the wave form of the vertical component of electric field in a bandwidth of 0 c/s at 11 Mc/s from 25 phases at known distances in the range 1–6 km deduced from the lay in hearing thunder. The atmospherics were recorded on magnetic tape at a subcarrier equency of 10 kc/s. Records of wave forms are reproduced and analyzed. Records from ound flashes and record from a flash at 5 km range appeared to be similar in amplitude and ave form. A study of the high frequency atmosphere in relation to that recorded at very w frequencies, since the latter contains large pulses originating in the return strokes, showed at the wave forms resemble those in the earlier storm. The high frequency atmospherics d peak amplitudes between 50 and 1500μ V./m, and those at very low frequency between 3 and 30 V./m. *Subject Headings:* **1. Lightning waves 2. Sferics from lightning 3. Sferics ave forms 4. Slough, Eng.**—*I.L.D.*

10.1–134 551.501.89:550.385

Watts, J. M. (*Nat. Bur. of Stand., Boulder, Colo.*), **Audio-frequency electromagnetic hiss corded at Boulder in 1956.** *Geofisica Pura e Applicata*, Rome, 37:169–173, **1957.** 4 figs., refs. **DLC**—Hissing noise is very frequently heard on receivers used for detecting whistlers uring geomagnetic disturbances. This phenomenon may be associated with the "dawn orus" or whistlers, but is distinct from either and also from sferics. The energy is con-ntrated in narrow band widths that fluctuate, giving a surging rather than a steady hissing fect. Relative amplitude of the hiss, compared with the geomagnetic field records, is shown aphically. The hissing begins about 8 hrs after the rapid commencement of the storm. ecords show the peak energy of the hiss was near 3 kc. Variations in spectra of hiss frequency e illustrated by numerous reproduced records from March–Dec. 1956, hissing was heard on out of 15 major magnetic storms recorded at Boulder, Colo., at Sunset Field Station. *Subject eadings:* **1. Hisses and geomagnetic storms 2. Sunset Field Station, Boulder, Colo.**—*M.R.*

10.1–135 551.501.9 551.582.2(238.1)

*Prohaska, Fritz (*Nat. Met. Ser., Buenos Aires*), **Über die meteorologischen Stationen r hohen Kordillere Argentiniens.** [Meteorological stations in the High Cordillera of rgentina.] *Sonnblick-Verein, Vienna, Jahresbericht*, Vol. 51/53, 1903–1955, pub. **1957.** 45–55. fig., 3 tables, 3 refs. **DLC**—A list of all stations in Argentina situated above 3000 eters above sea level including their geographical coordinates and period of record is given. he location of the high altitude stations which are situated in the provinces of Jujuy, Salta, a Rioja and Mendoza is described in detail. The climate of the Argentine Cordillera consists two principal types: a type dominated by the planetary west wind and that by advective mid warm air masses from southern Brazil in summer and by its position in the subtropical nticyclone in winter. The climates of the stations in these two climatic zones are described th the aid of numerical data giving mean monthly values of the meteorological elements for presentative stations in these zones (Cristo Redentor and La Quiaca) and graphs of the nual variations of wind direction frequencies at La Poma (Salta) and Santa Maria (Cata-arca). *Subject Headings:* **1. Mountain meteorological stations 2. Climate of Argentine ordillera 3. Argentina.**—*I.L.D.*

OBSERVATIONAL DATA

See also: **Handbook of geophysics** (Geophys. Res. Directorate), 10.1–3; **Cosmic ray stations for IGY, Canada and U.S.S.R.**, 10.1–43; **IGY obs. networks, Belgium** (Lahaye), 10.1–44; **Belgian IGY Antarctic Exped.**, 10.1–52; **Climate, Shackleton, Antarctica** (Stewart), 10.1–53; **Wind data analysis, Maudheim** (Hisdale), 10.1–55; **Antarctic expeds. and seismic soundings** (Doyen), 10.1–56; **Antarctic expeds., Mirny** (Červinskas), 10.1–58; **Historic weather records, Wales, England** (Oliver), 10.1–64; **History of U. S. W. B. climatological records** (Hagarty), 10.1–68; **Climatic data, France** (Geslin), 10.1–105.

10.1–136 551.506.1(782)

*Giorgio, P. (*Geophysics Research Directorate*), **Standard meteorological observations and station data.** (In: Lettau, H. H. and Davidson, Ben (eds.), **Exploring the atmosphere's first mile.** N. Y., Pergamon Press, **1957.** Vol. 1:15–16. 2 refs.) **DWB**—During all seven general observation periods standard temperature, relative humidity, station pressure and cloud cover were observed, at least hourly. A comparison between the readings of maximum and minimum in standard screen exposure at O'Neill and U. S. Weather Bureau climatological station (a distance of five miles) gave the following difference between the two points: -0.16 ± 0.28°F for the daily maximum temperature, and 0.72 ± 0.34°F for the daily minimum temperature. The screen effect was estimated by comparing standard thermometer readings (to the nearest 0.1°F) at the field site with standard readings of air temperature at 2.0 and 1.6 m measured with aspirated and shielded thermocouples. The average value of MIT-2.0 m temperature minus screen temperature was -0.69 ± 0.23°F, and J [ohns] H [opkins] -1.6 m—temperature minus screen temperature was -1.00 ± 0.23°F. The corresponding figures for the 0435 CST observations were 0.33 ± 0.28°F and -0.44 ± 0.37°F. *Subject Headings:* **1. Observational data 2. Maximum temperatures 3. Minimum temperatures 4. O'Neill, Nebr.**—*I.L.D.*

10.1–137 551.506.1:551.58(72)

*Vera Cruz, Mexico. Instituto de Meteorología Nautica, **Boletín Climático,** [Climatic Bulletin], Vol. 4, No. 32, 33, 35, and 38, Feb.–March, May–June, Aug. **1957.** 5 pieces, 8 p. each. Includes tables. **DWB**—This bulletin contains short articles on various aspects of the weather, notes on weather events and on the normal climatic regime of Vera Cruz, Mexico, during the month, and tide and solar lunar data for each day. Some of the articles are: Artificial rain (Feb. 1957), Atmospheric physics (Feb. 1957), Earth temperatures in geologic time (Feb. and March 1957), IGY (March and Aug. 1957), Instructions for observers (March and May, 1957), Geophysical research (May 1957), Weather in astronomy and physics (May and June 1957). *Subject Headings:* **1. Climatic data 2. Climatic normals 3. Climate of Vera Cruz, Mexico 4. Monthly climatic bulletins 5. Vera Cruz, Mexico.**—*M.R.*

10.1–138 551.506.2:551.582.2(493)

Sneyers, R., **Le temps en 1957.** [The weather in 1957.] *Belgium. Institut Royal Météorologique. Publications, Ser. B*, No. 24, **1958.** 48 p. 15 figs., tables. **DLC**—Description of the weather in Belgium during the year 1957 is presented. The author examines successively the evolution of the principal climatological factors during 1957 and makes comparisons with their normal values. The thermal excesses of winter and of the beginning of spring, the heat of the beginning of summer, the contrast in the abundant sunshine until the beginning of July, with the persistent deficiency which followed and, finally, the great variability of the precipitations flow are the main elements which gave the year 1957 its own individuality. *Subject Headings:* **1. Climatological data 2. Belgium.**—*A.V.*

10.1–139 551.506.3:551.577.2

Mayençon, R., **Contribution à l'étude des précipitations mensuelles d'Alger.** [Contribution to the study of the monthly precipitation in Algiers.] *La Météorologie*, Paris, Ser. 4, No. 50:89–101, April/June **1958.** 5 figs., tables. French, English and Spanish summaries p. 92. **DWB**—The author studies the monthly precipitation in Algiers, starting from a series of observations covering more than a century. He draws attention to the notion of

elation to the normal" which, for regions having a characteristic dry season, can produce a se idea of the pluviometry. *Subject Headings:* **1. Monthly precipitation 2. Dry season Algiers.**—*Author's abstract.*

10.1–140 551.506.7(729)

*Jordan, C. L. (*U. S. W. B.*), **Mean soundings for the West Indies area.** *Journal of eteorology*, 15(1):91–97, Feb. **1958.** 4 figs., 5 tables, 5 refs. **DWB, DLC**—Mean aerological ta for the West Indies area have been prepared from ten-year records for three stations. ean monthly height, temperature and relative humidity data are tabulated for constant essure surfaces. More detailed information, including density, potential temperature and ecific humidity, is shown for the mean annual and the mean "hurricane season" soundings. ie mean data are compared with those previously presented and some of the interesting matological features are discussed. *Subject Headings:* **1. Mean upper air data 2. Constant essure surfaces 3. West Indies.**—*Author's abstract.*

10.1–141 551.506.8:638.1

Koch, H. G., **Zur Phänologie der Bienenvölker.** [Phenology of bee swarms.] *Angendte Meteorologie*, 3(2):33–43, **1957.** 5 figs., 5 tables, 4 refs. **DLC**—In establishing a enology of bee swarms five developmental phases are considered and their dates of occurrence er a period of years are analyzed. These phases are as follows: first cleansing flight, beginning building activity, opening of the honey cells, first honey production and beginning of the termination of the drones. The observations were made in Oberwiesenthal (925 m) and era. An analysis of the scatter of phenological dates shows that their mean square deviation om year to year is an expression of variable weather; the scatter is a maximum in early spring d a minimum in early summer. The scattering minimum occurs during the opening of the ney cells. The mean scattering for all phases except the cleansing flight is considerably eater in Oberwiesenthal than in Gera owing to the weather produced crises; but in the lowids the phase variability is greater than the plant phenological phases. An analysis of the ean phenological dates for bees and plants indicates that, in spite of differences in their enological phases, the life of the bee is organized in relation to the phenological phases of ants. This is indicated clearly by an analysis of their relationships for particular years. ie phenological phases of bees and plants are correlated numerically for Oberwiesenthal, era and Bad Dürrenberg and presented in a table. Very high positive correlations between ossoming and building activity (0.77). Also a high positive correlation (0.71) between ossoming and opening of honey cells. The role of weather in these relationships is discussed. *bject Headings:* **1. Bee swarm phenology 2. Bees-plants phenological relationships Oberwiesenthal, Germany 4. Gera, Germany.**—*I.L.D.*

10.1–142 551.506.8:551.586.58

Primault, Bernard, **Contribution à l'étude des réactions végétales aux éléments météorogiques (L'apparition du printemps dans le canton de Neuchâtel de 1951 à 1954).** [Contribution to the study of vegetation reactions to meteorological elements: the appearance of ring in the Neuchâtel Canton, 1951–1954.] *Société Neuchâteloise des Sciences Naturelles, lletin*, 80:115–159, **1957.** 22 figs., 36 refs. German and English summaries p. 159. **DWB** The author first discusses the possible effects of the various meteorological elements upon nt development. He then examines the behavior of cumulative temperature and insolation rves as a function of altitude. Then, on the basis of observations at a phenological and a eteorological station, he compares data for two plants, one herbaceous plant and a shrub. nsidering the values obtained, he proposes the hypothesis that the herbaceous plant is st affected by sunshine duration, temperature playing only a retardatory part in case of ezing. The shrub appears to be affected more by cumulative temperature, slightly modified insolation. The behavior of the two plants as a function of altitude, local conditions and posure is also considered. Finally, annual isopleth charts for one vegetation phase of six nts are drawn and briefly discussed. *Subject Headings:* **1. Phenology 2. Temperature ect on plants 3. Insolation effects on plants 4. Neuchâtel, Switzerland.**—*A.V.* (*trans. G.T.*).

INSTRUMENT CARRIERS

See also: **Space travel** (Mallan), 10.1–31; **Satellite obs.** (Shternfel'd), 10.1–32.

10.1–143 551.507.351:551.551.5:551.574.1

MacCready, Paul B., Jr., **Research on atmospheric turbulence and freezing. Nuclei transport by means of a sailplane.** *Schweizer Aero-Revue*, Berne, 32(7):388–390, **1957. DLC**—Report on two series of flights with a sail-plane. The first one was intended to study the quantitative air turbulence (frequency and energy of different size vorticities). The indications obtained through a hot wire anemometer and an accelerometer were recorded on a magnetic tape. This technique has been tested, so that it will also be applicable to motor planes. The results confirm the rule following which the energy of vortices is proportional to the 5/3 power of their diameter. During the latter series of essays, one has tried to determine at the condensation level the amount of AgI particles issued by a ground generator. A condensation box mounted on a glider was used. *Subject Headings:* **1. Turbulence 2. Condensation physics 3. Vorticity energy 4. Glider flights.**—*A.V.*

10.1–144 551.507.352:551.515.3

Beebe, Robert G. (*U. S. W. B., Kansas City, Mo.*), **The 1956 Tornado Research Airplane Project data.** *American Meteorological Society, Bulletin*, 38(10):575–578, Dec. **1957.** 2 tables, 4 refs. **DWB, DLC**—The purpose of this article is to describe the project and its objective, the kinds of flights that were made, and to summarize the kinds of data available to researchers. A summary of the flight areas, dates, times, and levels is shown in tabular form. A sample data sheet shows the data presentation. These data may be borrowed from the U. S. Weather Bureau, Washington 25, D. C. *Subject Headings:* **1. Aircraft tornado reconnaissance 2. Tornado research 3. Tornado research airplanes.**—*Author's abstract.*

10.1–145 77:656.7 551.507.362:77

*Schwidefsky, Kurt (*Oberkochen/Württ*) **Der Informationsinhalt von Luftbildern und die optische Beobachtung aus Raketen und Satelliten.** [Information contained in aerial photographs and optical observations from rockets and satellites.] *Naturwissenschaftliche Rundschau*, Stuttgart, 11(4):132–138, April **1958.** 7 figs., table. **DWB, DLC**—The author examines the data obtainable by optical observations from airplanes, rockets and satellites utilizing the naked or aided eye, photography or electric recording or transmission of a picture on the cathode of a television tube. The resolving capacities of the unaided human eye, of the eye aided by telescopes, of the objectives of aerial cameras and of television cameras are compared. Photographs obtained with an aerial are found superior to the results of ocular vision and television. The discussion includes the characteristics of the information, content of an aerial picture, the importance of contrast as provided by differences in color and brightness, the effect of atmospheric turbidity upon aerial photographs and infrared aerial photography; the area that can be included by aerial photographs—including both horizontal and vertical dimensions and optical observations from rockets and satellites. The latter includes a brief account of the history of the use of rockets for photography and a consideration of the image conditions (field of visibility, angle of vision, scale, etc.) at different elevations and the quality of photographs from rockets and satellites. *Subject Headings:* **1. Aerial photography 2. Rocket photography 3. Color contrast 4. Satellite observations.**—*I.L.D.*

10.1–146 523.77:551.507.362.1:551.510.53

Meadows, E. B. and Townsend, J. W., Jr. (*U. S. Naval Research Lab.*), **Diffusive separation in the winter night time Arctic upper atmosphere 112 to 150 km.** *Annales de Géophysique*, Paris, 14(1):80–93, Jan./March **1958.** 8 figs., 10 refs. French and English summaries p. 80. **DLC.** Also in: *International Geophysical Year*, 1957/1958. *IGY World Data Center A, IGY Rocket Report Series*, No. 1:107–119, July 30, **1958. DWB**—The composition of the upper atmosphere between 105 and 241 km has been measured by means of a rocket borne radio frequency mass spectrometer. The instrument was flown on an Aerobee-Hi rocket, NRL-48 (IGYNN3, 17), at 2321 h CST on Nov. 20, 1956, at Fort Churchill, Manitoba, Canada. Ninety-six spectra were obtained on the ascent of the rocket and seven spectra on the descent

of the rocket over the range 52 to 6 AMU. From an analysis of these spectra, data have been obtained which show that there was diffusive separation of argon and nitrogen in the region 112 to 150 km. Extrapolation of the data indicate that separation began by about 105 km. Data were also obtained on the general composition of the upper atmosphere over the regions covered in flight. These data show the presence of atomic oxygen. *Subject Headings:* **1. Upper atmosphere composition 2. Rocket measurements 3. Mass spectrometers 4. Diffusive separation of argon and nitrogen 5. Fort Churchill, Canada.**—*Authors' abstract.*

10.1–147 523.77:551.507.362.1:551.510.53

Townsend, J. W., Jr. and Meadows, E. B. (*U. S. Naval Research Laboratory*), **Density of the winter night time Arctic upper atmosphere 110 to 170 km.** *Annales de Géophysique*, Paris, 14(1):117–130, Jan./March **1958.** 7 figs., 5 eqs., 6 refs. French and English summaries p. 117. **DLC.** Also in: *International Geophysical Year*, 1957/1958. *IGY World Data Center A, IGY Rocket Report Series*, No. 1:14–25, July 30, **1958. DWB**—The density of the arctic upper atmosphere during the winter night has been measured over the interval 110 to 170 km by means of mass spectrometer mounted in an Aerobee-Hi rocket. The rocket, NRL-48 (IGYNN3, 17), was fired at 2321 CST on Nov. 20, 1956, at Fort Churchill, Canada. The primary purpose of the flight was to obtain the composition of the upper atmosphere, but due to a fortunate rocket altitude on the ascent of the rocket it has also been possible to determine the atmospheric density during the period of time mass spectra were obtained. The density profile obtained is higher than that found above White Sands Proving Ground in the region 110 to 145 km, and lower above this level. *Subject Headings:* **1. Upper atmosphere density 2. Winter night 3. Mass spectrometers 4. Fort Churchill, Canada.**—*Authors' abstract.*

10.1–148 551.507.362.1

Pressly, E. C. and Townsend, J. W., Jr., **Aerobee-Hi report Number 5, the NRL-45, NRL-47, NRL-43, NRL-48, NRL-40, NRL-41 and NRL-44 firings.** *U. S. Naval Research Laboratory, NRL Report* 5076; *Upper Atmosphere Research Report*, No. 31, Feb. 6, **1958.** 39 p. 13 figs., 7 tables, 7 refs. **DWB** (M11 U58u)—The Navy Aerobee-Hi development program was brought to a close during 1956 and 1957 with the firings of NRL-45, -47, -43, and -48 at Fort Churchill, Manitoba, Canada, and of NRL-40, -41, and -44 at White Sands Proving Ground, New Mex. Aerobee-Hi NRL-45 exploded in the tower while being held under full pressure pending the presence of an aurora overhead. Aerobee-Hi NRL-47 was partially successful, reaching an altitude of 74 mi. Aerobee-Hi NRL-43 was a good flight with a peak altitude of 121 mi. Aerobee-Hi NRL-48 was highly successful, the peak altitude being 155 mi. Aerobee-Hi NRL-40 reached an altitude of 127 mi, which was less than predicted. Aerobee-Hi NRL-41 reached a record altitude of 180 mi. Aerobee-Hi NRL-44 was successful, achieving the predicted altitude of 126 mi. These tests have proved the feasibility of the RV-N-13c, Navy Aerobee-Hi design and have shown that the upper air scientists who are to use this vehicle extensively during IGY will have a rocket which meets all of the principal specifications set for it at the beginning of the development program in 1953. *Subject Heading:* **1. Aerobee rocket firings.**—*NRL abstract.*

INSTRUMENTS

See also: **Radio meteorology** (Khakhalin), 10.1–10; **Aerostat soundings, Moscow** (Deviatova), 10.1–14; **Thermometer shelter comparisons** (Utaaker), 10.1–15; **Wilson cloud chamber** (Gentner et al.), 10.1–38; **Radiosonde ascension rates** (Sinha), 10.1–126; **Use of thermistors in thermometry** (Petit), 1;.1–128; **Radiosonde hypsometers** (Conover, Stroud), 10.1–155; **Global radiation measurements** (O'Connor), 10.1–229.

10.1–149 551.508.2:551.593.5:551.521.326

Cailliatte, Ch., **Sur quelques mesures de la luminance du ciel nocturne dans le proche infrarouge.** [Some measurements of nocturnal sky luminance in the near infrared.] *Académie des Sciences, Paris, Comptes Rendus*, 245(20):1739–1740, Nov. 13, **1957.** 5 refs. **DLC**—With a view to determine directly, in the infrared field, the sky luminance with regard to

stars, the author placed a Fabry photometer at the Cassegrain focus of the 81 cm telescope of Haute-Provence Observatory. Measurements made in the 0.72–0.89μ band through C. FABRY's method, led to a luminance in the near infrared about 16 times as great as the value found in the blue (difference: 3 magnitudes). *Subject Headings:* **1. Night airglow luminance 2. Photometers 3. Haute Provence, France.**—*A.V.*

10.1–150 551.508.2:551.524.7

Petit, M. and Pepipta, A., **Un thermomètre à corde vibrante pour la mesure de la température de l'air dans la stratosphère.** [A thermometer with vibrating string for temperature measurements in the stratosphere.] *Journal Scientifique de la Météorologie*, Paris, 10(37):41–46, Jan./March **1958.** 2 figs., 7 refs., 12 eqs. French, English and Spanish summaries p. 41. **DWB**—A thermometer with vibrating wire element was found to be without errors of inertia or radiation in radioballooning up to at least 35 km altitude. The construction and electronic maintenance device of the instrument are studied and described. *Subject Headings:* **1. Thermometers 2. Stratosphere temperature measurement techniques.**—*Authors' abstract.*

10.1–151 551.508.21

Jacob, M. (*Div. de Climatologie de l'I.N.E.A.C., Congo Belge*), **Albédomètre portatif à lecture directe utilisant une méthode de zéro.** [A portable direct-reading albedometer with null-method.] *La Météorologie*, Paris, Ser. 4, No. 48:545–547, Oct./Dec. **1957.** 4 figs. **DWB**—This apparatus was designed to make measurements of the albedo of soils and vegetable mats lower than ca. 1 m. Measurements can be made either with photoelectric cells or with nonselective receivers, and the measurement method can naturally be used to determine the ratio between any two illumination intensities. Particular characteristics of this instrument are as follows: 1) Both the needed measurements of radiation are simultaneous, 2) A null-method is used for the measurement which gives the value of sought ratio through direct reading on a graduated knob. *Subject Headings:* **1. Albedometers 2. Belgian Congo.**—*A.V.*

10.1–152 551.508.21:551.521.16

Vassy, Etienne and Vassy, Arlette, **Sur la variabilité diurne et annuelle de l'éclairement solaire reçu au niveau du sol.** [Diurnal and annual variability of the solar illumination received at ground level.] *Académie des Sciences, Paris, Comptes Rendus*, 246(11):1723–1725, March 17, **1958.** 1 fig., 2 refs. **DLC**—Description of a recording lux-meter which measures the illumination received at the ground level on a horizontal surface; the light coming direct from the sun and the light diffused through the atmosphere are received by a cell with a stop layer, compensated in such a way as its spectral sensitivity is identical to the relative visibility curve of the average human eye. The record of illumination received on a horizontal surface (Val Joyeux) showed the importance of changes due to cloudiness, and also the seasonal variations. *Subject Headings:* **1. Luxmeters 2. Solar illumination variations 3. Val Joyeux, France.**—*A.V.*

10.1–153 551.508.25 523.7

Dollfus, A., **Un polarimètre photoélectrique très sensible pour l'étude du soleil.** [A very sensitive photoelectric polarimeter for the study of the sun.] *Académie des Sciences, Paris, Comptes Rendus*, 246(16):2345–2347, April 21, **1958.** 2 figs., 3 refs. **DLC**—Description of an instrument allowing polarization measurements of a very high sensitivity of intense luminous fluxes. Even without an eclipse, the author was able to observe the light diffused by the electrons of the solar corona, take measurements of the polarization of the light of the photosphere, and to find evidence of polarization of the light from sunspots. *Subject Heading:* **1. Photoelectric polarimeters.**—*A.V.*

10.1–154 551.508.41

Beving, R., **Baromètre étalon du Centre Technique de la Météorologie Nationale.** [The standard barometer of the Technical Center of the National Meteorological Service.] *La Météorologie*, Paris, Ser. 4, No. 47:445–450, July/Sept. **1957.** 4 figs. French, English and Spanish summaries p. 445. **DWB**—The standard barometer constructed at Trappes in accordance with the resolution of Commission of Instruments and Methods of Observation

of the WMO, in accordance with recommendations of Ch. E. Guillaume, consists of a pyrex tube 8 mm in interior diameter for most of its length and of 30 mm in interior diameter in the zone of observation. It plunges into a metallic bulb with a surface area of about 100 mm². In illustrating the measurement of the height of the mercury column with the aid of diagrams and equations, the author discusses the adjustment of the mercury in the bulb, the adjustment of the upper level of the bulb, corrections of the readings (corrections to 0°C), compressibility of mercury, residual pressure in the barometric chamber and correction for refraction of glass in the reading zone. A comparison between this barometer and the Fortin barometer shows that, of 22 observations, 73% give a deviation less than 0.02 mm with respect to mean correction and 23% of the observations give a deviation less than 0.09 mm with regard to the mean correction. *Subject Headings:* **1. Barometers 2. Barometer corrections.**—*I.L.D.*

10.1–155 551.508.45:551.508.822

Conover, Walter C. and Stroud, W. G. (*both, U. S. Army Signal Eng. Labs., Fort Monmouth, N. J.*), **A high-altitude radiosonde hypsometer.** *Journal of Meteorology*, 15(1):63–68, Feb. **1958.** 8 figs., table, 3 refs. **DWB, DLC**—Efforts to improve the basic design of a high-altitude radiosonde hypsometer have resulted in a working model consisting of a small vacuum flask filled with cotton which has been saturated with carbon-disulfide, and in which is immersed a bent-stem bead thermistor. In laboratory tests this device proved capable of measuring pressures within one percent in the range 300 to five mb and within two percent in the range five to two mb. Flight tests using only an aneroid capsule as the pressure "standard" have shown that this model functions with an accuracy of two to five percent in the pressure range 30 to two mb. *Subject Heading:* **1. Radiosonde hypsometers.**—*Authors' abstract.*

10.1–156 551.508.7:535.24

Mikirov, A. E., **Analizator chastits oblakov i osadkov.** [Cloud and precipitation particle analyzer.] *Akademiia Nauk SSSR, Izvestiia, Ser. Geofiz.*, 12:1529–1531, **1957.** 3 figs., 5 refs. **DLC**—In both the methods employing a light field and an induction coil or a photoelectric cell to determine the size and charge spectrum of precipitation and cloud particles, analysis of the experimental results encounters considerable difficulty because of the small velocity of movement of the oscillograph ribbon. This problem can be solved by using an electron tube as an analyzer. The impulses from either the photomultiplier and induction coil, or from two photomultipliers, are allowed to impinge upon an inclined plate of an electron tube. An inclined line is obtained on the screen of the tube in the ideal situation. The inclination of this line determines the relation of the impulses and hence allows one to determine whether the particles were fluid or solid; the amplitude of the impulses gives the size of the particles. Photographing the figure on the screen on one frame of film is impossible unless a point instead of a line is formed on the screen. This is achieved by working with an absorbed electron beam and by sending an impulse arriving at the inclined plate after suitable delay to the modulator of the electron beam tube. The apparatus built on this principle is described with the aid of a diagram and its manner of operation is illustrated. *Subject Headings:* **1. Precipitation analyzer 2. Cloud particle analyzer 3. Photoelectric cells.**—*I.L.D.*

10.1–157 551.508.77

*U. S. Corps of Engineers. South Pacific Div., **Development and test performance of radio isotope-radiotelemetering snow gage equipment.** Project Cwi-170, (Unnumbered Report), April **1956.** 47 p. 37 figs., 4 tables, 23 eqs. Also: Ward, W. H., **Radio-isotope snow gauge.** *Journal of Glaciology*, Cambridge, 3(23):223, March **1958.** Also: Smith, Philip M., **An electrical crevasse detector: comments on Ward's article.** *Ibid.*, p. 224–225. **DWB, DLC** (M08.77 U581d)—The snow gage equipment developed under Civil Works Investigation Project Cwi-170 essentially consists of a gamma-ray source (Co^{60}) installed in a concrete block flush with the ground surface, a G-M tube suspended 15 ft overhead, amplifier, VHF radio transmitter, radio relay station and receiver. The theory, construction, testing and performance of this equipment are discussed in detail. Factors affecting the performance, such as cosmic radiation, decay of radioactive material, characteristics of G-M tubes, collimation of radiation, rise in radio transmissions, power supply and clock operation are considered.

Illustrations and schematic diagrams of the installation and its components and tables and graphs of a water equivalent measured to performance characteristic curves from 1949 to 1953 are included. A "Memorandum report on wind changes" is appended. WARD gives a 1 page review of this report. *Subject Headings:* **1. Radio-isotope-radiotelemetering snow-gage equipment 2. Snow-gage equipment. I. Hildebrand, Carver E.**—*G.T.*

10.1–158 551.508.82 551.501.81:551.515.2

Hilleary, D. T. and Christensen, F. E. (*both, Research Oper. Base, Natl. Hurricane Res. Proj., West Palm Beach, Fla.*), **Instrumentation of National Hurricane Research Project aircraft.** *U. S. Weather Bureau, National Hurricane Research Project Report*, No. 11, Aug. **1957.** 71 p. 37 figs. (incl. photos), 3 tables, 13 refs. **DWB** (M15.2 U5845r)—An elaborate discussion and illustration of air-borne equipment for measuring winds, pressure, temperature, humidity, sea surface temperature, electric field, icing, turbulence, cloud physics parameters, clouds and many other elements during hurricane reconnaissance flights. Laboratory and flight calibrations are also presented in graphs and tables. *Subject Headings:* **1. Air-borne instruments 2. Hurricane reconnaissance instrumentation.**—*M.R.*

10.1–159 551.508.822

Graafen, H., **Ein Beitrag zur Verbesserung der Bimetall-Ventilation bei der Radiosonde "Graw H 50."** [Contribution to the improvement of the bimetal-ventilation of "Graw H 50" radiosondes.] *Germany. Deutscher Wetterdienst. Instrumentenamt Hamburg, Technische Mitteilungen des Instrumentenwesens*, New Series, No. 3:29–38, **1957.** 9 figs., 7 refs. **DWB**—The radiation error in temperature measurement with a bimetallic element depends upon the distance between the balloon and sonde. The ventilation of the bimetallic element depends not only on the ascent velocity of the sonde but is influenced also by the swinging movements of the sonde. A maximum ventilation velocity which exceeds the ascent velocity by 15% is attained at an advection angle of 30 to 25°. A horizontal component of flow of 3 m/sec which occurs during swinging movements reduces the ventilation velocity to 1/3 of the ascent velocity. The high swinging velocities can be avoided by large distances between balloon and sonde. The ventilation can be increased by 30% by cone like attachments to the ventilation tubes if, in addition to most suitable opening angles and length of the outer exit tube, a length relationship of 1.5 is established between the outer and inner exit tube. *Subject Headings:* **1. Radiation error of radiosondes 2. Radiosonde ventilation 3. Graw radiosondes.**—*Based on author's abstract (I.L.D.).*

10.1–160 551.508.85:551.577

Lhermitte, Roger, **Sur la fluctuation des échos de précipitation.** [The fluctuation of precipitation echoes.] *Académie des Sciences, Paris, Comptes Rendus*, 246(8):1245–1248, Feb. 24, **1958.** 1 fig., 2 refs. **DLC**—The periods of fluctuations of echoes issued from precipitation observed by means of a radar with fixed vertical beam appear to be very different according to the nature of the particles which determine these echoes. These differences, which are put into evidence by using a photographic recording method, are sufficiently clear to allow the identification of the particles. *Subject Headings:* **1. Precipitation echoes 2. Radar with fixed vertical beam.**—*A.V.*

10.1–161 551.508.85:551.501.81:551.577.11

Lhermitte, R., **L'utilisation météorologique d'un radar à faisceau vertical fixe.** [The meteorological utilization of a radar with fixed vertical beam.] *Journal Scientifique de la Météorologie*, Paris, 10(37):1–10, Jan./March **1958.** fig., 2 photos, 6 refs. French, English and Spanish summaries p. 1. **DWB.** Also his: **L'utilisation météorologique des échos de pluie.** [Meteorological utilization of rain echoes.] *Meteorological Society of Japan, Tokyo, 75th Anniversary Vol. of the Journal*, pub. Nov. **1957.** p. 72–82. 6 figs. **DWB, DLC**—Radar equipment with fixed vertical beam, operating on the 3.2 cm wavelength, has been built and is used for observation and study of precipitation. After having described this equipment, and in particular a recorder showing two echo intensity levels by two different inscription colors, certain aspects of interpretation of the results are offered, particularly surveys of the bright melting band appearing with sharpness on the majority of recordings. *Subject Headings:*

.. **Radar with fixed vertical beam 2. Precipitation study 3. Magny-les-Hameaux, France.** —*Author's abstract.*

10.1–162 551.508.95

Raynor, Gilbert S. (*Brookhaven Natl. Lab., Upton, Long Island, N. Y.*), **An automatic programming filter sampler.** *Air Pollution Control Association, Journal,* 7(2):122–124, August **1957.** 3 figs., table, 11 refs. **DWB, DLC**—A completely new design to meet the challenge of air filter samplers has been developed by RAYNOR for the meteorology group at the Brookhaven National Laboratory. It consists of 10 solenoid-operated valves connected to a common chamber through which air is drawn by a vacuum pump, a timing unit and a program board for the collection of particles needed. *Subject Heading:* **1. Air sampling filters.** —*N.N.*

10.1–163 523.77 551.508.953

Gebbie, H. A., **Spectres d'absorption atmosphérique dans l'infrarouge lointain par interférométrie à deux ondes.** [Absorption spectres in distant infrared by two-wave interferometry.] *Journal de Physique et le Radium,* Paris, 19(3):230–232, March **1958.** 1 fig., 5 refs. French and English summaries p. 230. **DLC**—For wavelengths shorter than microwaves (where coherent generators are available), two beam interference methods have distinct advantages over usual spectroscopic methods. An example of a far infrared spectrum obtained from an interferogram by numerical analysis is given. *Subject Heading:* **1. Atmospheric absorption spectra.**—*Author's abstract.*

10.1–164 551.508.99:551.510.7

Schumann, G. (*Zweites Physikalisches Inst., Univ. Heidelberg*), **Filters for sampling atmospheric radioactivity.** *International Geophysical Year,* 1957/1958, *Annals,* 5(*IGY Instruction Manual*), Pt. 5:355–358, **1958.** 4 refs. **DWB**—As radioactive substances in the atmosphere, except gases, are aerosol-particle size, they can be retained by filters. The retaining mechanism is not yet clear, nor is there any conclusive evidence concerning the existence of any selectivity either for particles of any special size or chemical constitution. Fixed or moving filters may be used. The efficiency of a filter increases with increasing retaining power and decreasing resistance. The filter itself may be examined directly for its activity by means of a counter or it may be ashed or treated chemically and the residue counted. The time of exposure must be adjusted to the lifetime of the substance to be studied. The method allows detection of active substances which have long half-lives or are present in a very low concentration. *Subject Headings:* **1. Radioactive measuring devices 2. Radioactive filters.**—*Author's abstract.*

SYNOPTIC ANALYSIS AND FORECASTING

See also: **Large scale weather processes,** 10.1–5; **Typhoon forecasting, China** (Gherzi), 10.1–24; **Synoptic met. textbook reviews** (Bergeron), 10.1–63; **Transoceanic shipping forecasts, No. Atlantic** (King), 10.1–82; **Microseismic storm detection, Japan** (Kishinouye, Shida), 10.1–87; **Forecast studies from Panagra's met. files** (Larson), 10.1–99; **Agromet. forecasting** (Babushkin), 10.1–103; **Agromet. forecasting** (Bulinskaia), 10.1–104; **Thermal troughs, No. Atlantic and Gt. Brit.** (Miles), 10.1–217; **Bibliog. on works of C. E. P. Brooks,** p. 99.

10.1–165 551.509.318:551.515.3

Kolobkhov, N. V., **Smerch pod Moskovoĭ.** [Tornado near Moscow.] *Meteorologiia i Gidrologiia,* Leningrad, No. 6:32–33, June **1957.** 2 figs. **DWB**—The synoptic conditions associated with the occurrence of a tornado on Aug. 25, 1956 at 1800 h are described. On that day severe thunderstorms, with storms south of Moscow associated with the passage of a deep cyclone which brought with it tropical southern air, brought about a tornado when the moist tropical air began to be replaced by cold maritime air from western parts of the U.S.S.R. The tornado arose at the cold front. An analogous synoptic condition accompanied the tornadoes in Kazan on Aug. 5, 1956. *Subject Headings:* **1. Synoptic conditions for tornadoes . Tornado, Moscow (Aug. 1956) 3. Moscow, U.S.S.R.**—*I.L.D.*

10.1–166 551.509.318:551.515

Riaguzov, V. N., **Shtormy ozera Issyk-Kul'.** [Storms on Lake Issyk Kul.] (In: Akademiia Nauk Uzbekskoĭ SSR. Institut Matematiki i Mekhaniki, **Meteorologiia i gidrologiia v Uzbekistane.** Tashkent, **1955.** p. 163–177. 5 figs., 3 tables, 10 refs.) **DLC**—All recorded observations of storm winds (velocity at least 17–18 met/second) recorded over the Issyk Kul during the period 1948–1953 (124 storms) are characteristic of the aerosynoptic processes associated with all storms. Five fundamental synoptic situations or types were found to be associated with the storms. They are as follows: (1) the ultrapolar high altitude trough oriented from western Siberia to Ust Urt; (2) the central cyclone over the southern Urals and western Kazakhstan; (3) quasistationary cyclone over the lower part of the Syr Darya; (4) the high altitude ridge of the "Omega" type over the Urals and western Siberia; and (5) the extensive central cyclone over European territory of the U.S.S.R. These various types are described with the AT_{500} and $OT_{500/1000}$ charts and data are given on the monthly and annual distribution of the storms for each year of the period, distribution of storm winds by months and frequency of types of aerosynoptic situations leading to storm winds over Issyk Kul. *Subject Headings:* **1. Synoptic conditions for storms 2. Storm distribution 3. Storm frequencies 4. Lake Issyk Kul, U.S.S.R.**—*I.L.D.*

10.1–167 551.509.324:551.576.1

Alt, J., **Cirrus et nuages cirriformes.** [Cirrus and cirrus-shaped clouds.] *La Météorologie*, Paris, Ser. 4, No. 49:35–58, Jan./March **1958.** 24 figs., 10 refs. French, English and Spanish summaries p. 35. **DWB**—In the first part, the author makes a very complete statistical survey of cirrus based on 1375 observations spread over from July 1, 1950 to June 30, 1957. The results obtained quite agree with those obtained by foreign authors during similar surveys. In a second part, the author deals briefly with different methods of cirrus forecasting As results on the whole were disappointing, he finally intends to establish a correlation among a certain number of situations at 300 mb and presence of cirrus. *Subject Headings:* **1. Cirrus clouds 2. Cirrus cloud forecasting.**—*Author's abstract.*

10.1–168 551.509.52:551.515.2:551.542.1

Hashimoto, Masayoshi, (*Kobe Marine Obs.*), **On the forecasting of the movement of the typhoon, Pt. 3.** *Kobe, Japan. Marine Observatory, Memoirs*, 12(2):19–26, March **1958.** 12 figs., 2 refs. **DWB**—For the purpose of computation of the general pressure gradient that plays an important role in the forecasting of the movement of the typhoon, we chose four representative points, which lie at a distance equal to the diameter of the circle "S" (an inscribed circle of the outermost closed isobar) from the center of a typhoon to north, south, east and west, respectively, and we take the pressure gradients at these four points as general pressure gradients and estimate the moving direction of the typhoon from the resultant of two moving directions on the surface and at the 500 mb level. Also we found the relationship between the absolute value of the vector of the moving direction and the twice value of the diameter of the circle "S." And some trials were done applying the results to the practice of the forecasting for the interval of 24 hrs. *Subject Headings:* **1. Typhoon movement forecasting 2. Pressure gradient.**—*Author's abstract.*

10.1–169 551.509.52:551.515.23:016

†Hoover, Eugene W. (*Wash. Natl. Airport*), **Devices for forecasting movement of hurricanes.** Wash., D. C., U. S. Weather Bureau, Jan. **1957.** 84 p. 17 figs., 41 refs.+abstracts. **DWB**—This manuscript (mimeo) paper outlines in 5 chapters the organization, the models for northward movement of a hurricane as it approaches the westerlies, the steering force in hurricane movement, application of this knowledge in practical forecasting, and the effect of 500 mb, 24-hr height changes in hurricane movement. An extensive Appendix gives abstracts and extracts from 41 papers on subjects related to hurricane path forecasting arranged under 24 subject heads. *Subject Headings:* **1. Hurricane movement forecasting 2. Hurricane steering 3. Hurricane bibliographies.**—*M.R.*

10.1–170 551.509.52:551.515.2 551.511.32:551.515.21

House, Donald C. (*Severe Local Storms Forecast Center, Kansas City, Mo.*), **Air mass modification and upper-level divergence.** *American Meteorological Society, Bulletin*, 39(3):

37–143, March 1958. 8 figs., 8 refs., 5 eqs. **DWB, DLC**—High level divergence (above 00 mb) coupled with low level convergence will produce vertical motion and result in air mass odification producing conditions favorable for severe storms or tornadoes. Examples of 3 ntrasting situations are analyzed: one in autumn (Oct. 28, 1955), when there is a strong 00 mb jet stream over the Southern Plains and Mississippi Valley, and the other in the warm ason (May 29, 1956) with high level streamline divergence (200 mb) rather than speed vergence; both resulting in severe storms. Actual and computed soundings are compared r stations near the severe storms and for the immediate vicinity of the storms, respectively. ynamic cooling may offset advectional warming in such situations as represented by the cond example. Modification occurs at high levels 30–40 thousand ft in this case, but at 0–30 thousand ft in the first example. *Subject Headings:* **1. Severe storm forecasting 2. Tor-ado forecasting 3. Upper level divergence effects 4. Air mass modification.**—*M.R.*

10.1–171 551.509.53:551.515.8

§Buckler, S. J., **An investigation of the cold outbreak of September 9, 1955 in Western anada.** *Canada. Meteorological Division, CIR.* 2785, TEC. 233, May 11, **1956.** 17 p. figs., 8 refs. **DLC**—A case history study of an Arctic air invasion which moved faster and rther southwest (against the Rockies) than predicted, thus making the forecasts for Calgary id Lethbridge completely erroneous—sunny and 65° was forecast—instead snow and near eezing weather occurred over southern Alberta. A post-analysis shows that the error lay in ot predicting deepening at 500 mb and consequent accelerated southward movement of the ld air mass from the Beaufort Sea. The retrogression of the long wave trough from near reenland to Hudson Bay was one of the links in the development. A check of 20 such anti-clones Sept.–Oct. 1945–1954 shows that 8 were from the N. Pacific and 12 from Arctic. f these, only one followed the path of the Sept. 9, 1955 outbreak and that one moved at only 3 mph instead of nearly 40 mph. Hence, this cold wave could not have been predicted from nalogs or from climatological conditions (the summer of 1955 was the first cold summer over ie Beaufort Sea in years), but might have been anticipated if vorticity advection and deepen-g had been calculated, rather than the actual method used which involved sample extra-olation of the motion during the past 24 hrs. Several surface and 500 mb charts (Sept. 8–10) id soundings are presented. *Subject Headings:* **1. Cold wave forecasting 2. Synoptic case story studies 3. Southern Alberta, Canada.**—*M.R.*

10.1–172 551.509.532:551.524.37

Otorepec, S., **Rani i pozni mrazevi s naročitim osvrtom na njihovu pojavu u Vojvodini.** Early and late frosts with special attention to their occurrence in Voivodina (Pt. 1).] *Yugo-avia. Hidrometeorološka Služba, Vesnik,* 5(1/2):36–42, Jan./June **1956.** fig., eqs. **Pt. 2,** *bid.,* 5(3/4):110–116, July/Dec. **1956.** table, 14 refs. **DWB**—Physical conditions for the ccurrence of freezing temperatures and methods of frost forecasting are discussed. The fore-isting methods described are: 1) the Lang dew point method, 2) KAMMERMANN's method 1885), 3) SCHUBERT's method (1915), 4) the method of REINHARD and FAUST, 5) the maximum-inimum method by E. S. NICHOLS, 6) ÅNGSTRÖM's formula and 7) a method by LUTERŠTAJN hich was recently tested in Croatia with poor results. The second part of the paper takes o frost probabilities in Voivodina including a table showing, for seven stations, earliest and test date of 80% frost probability, probability of occurrence of earliest and latest day of ost before Nov. 10 and after March 15, respectively, and duration of frost-free period. [ethods of frost protection are also discussed, namely: 1) Heat conservation—(a) covering of ants, b) fog and smoke generation and c) flooding or spraying); 2) Mixing of air and 3) Supply-ig of heat. *Subject Headings:* **1. Frost forecasting 2. Frost probability 3. Frost protection Voivodina, Yugoslavia.**—*G.T.*

10.1–173 551.509.54

Bryson, Reid A., **Some factors in Tucson summer rainfall.** *Arizona. Univ. Institute Atmospheric Physics, Technical Reports on the Meteorology and Climatology of Arid Regions,* o. 4, May 31, **1957.** 26 p. 7 figs., 2 tables, 9 refs. **DWB**—This report describes an in-estigation of several synoptic and airmass factors as they relate to the occurrence and amount daily rainfall at Tucson, Arizona. Of the variables considered as predictors of rain later

the same day, three stand out as useful: total precipitable water, Showalter Stability Index, and distance south of the last closed contour of the circumpolar vortex at 500 mb. Better than 90% correct short-term forecasts appear attainable for occurrence of rain, while about twice as many correct forecasts as might be expected by chance were obtained in forecasting rain amount class. *Subject Headings:* **1. Rainfall forecasting 2. Precipitation amount 3. Synoptic analysis 4. Air masses 5. Tucson, Ariz.**—*Author's abstract.*

10.1–174 661.509.54:551.578.43

§Jackson, A. W., **Synoptic picture associated with moderate to heavy snowfall at Vancouver.** *Canada. Meteorological Branch, CIR-2900,* TEC-249; Local Forecast Study, No. 31, Vancouver District, March 29, **1957.** 4 p., 4 figs., 3 refs. **DWB**—Cases of moderate to heavy snowfall (2 or more in. in a 6-hr period) at Vancouver during the 10 winters 1946–1956 were studied with a view to improving snow forecasts for the city. Heavy snowfall at Vancouver was found to occur in advance of a surface storm of moderate development moving southeastward from Queen Charlotte Sound. Another necessary criterion is the presence of continental Arctic air, either fresh or modified, over the lower mainland. *Subject Headings:* **1. Snowfall forecasting 2. Snowfall extremes 3. Vancouver, British Columbia.**—*Author's abstract.*

10.1–175 551.509.54:551.515.4:551.577.37

Otsuka, R. (*comp.*), **On the local heavy rain associated with the thunderstorm of July 22, 1955.** *Journal of Meteorological Research,* Tokyo, 9(7):508–512, July **1957.** 10 figs., eq. In Japanese, English summary p. 408. **DWB, DLC**—This is the summarized report of the discussions at the meeting of forecasters from the stations in the inland regions of the Kanto District in Nov., 1956. Though the forecasting of local heavy rain associated with thunderstorm is very difficult at present, some of methods and principles were pointed out as useful tools for the forecasting of local heavy rain. The practical application of radar system was also emphasized. The distribution of vorticity and instability, cold and warm air advection along frontal surface, depth and height of cold airmass and distribution of ascending velocity, etc. were discussed. *Subject Headings:* **1. Thunderstorm rainfall 2. Heavy rainfall forecasting 3. Kanto District, Japan.**—*Author's abstract.*

10.1–176 551.509.54

Pandolfo, Joseph P. (*New York Univ.*), **An objective method for forecasting precipitation type during the winter months at New York City.** *American Meteorological Society, Bulletin,* 38(10):371–574, Dec. **1957.** 6 figs., 2 tables, 6 refs. **DWB, DLC**—A method for forecasting precipitation type during the winter months at New York City is developed. Surface temperature, freezing level, and horizontal temperature advection at 850 mb are the forecast parameters used. Results of a test of the method indicate that the assumptions applied in the development are valid. *Subject Headings:* **1. Objective forecasting techniques 2. Objective precipitation type forecasting 3. New York, N. Y.**—*Author's abstract.*

10.1–177 551.509.54:551.576.11

Reynolds, Ralph D. (*U. S. Army Electronic Proving Ground, Fort Huachuca, Ariz.*), **Cumuloform shower forecast technique for Southern Arizona.** *American Meteorological Society, Bulletin,* 38(9):518–520, Nov. **1957.** 5 figs. **DWB, DLC**—On the basis of upper air moisture and temperature conditions during summer over Arizona, the dew point temperature shows an increase during the rainy season, especially in the 700 mb region, while the free air temperature rose uniformly at all levels. On the basis of six years of upper air and surface observations, a critical dew point temperature for the formation of cumuloform showers over Arizona was developed. For Tucson, a critical dew point at 700 mb of +1°F with 80% accuracy was obtained. In the case of Phoenix, the best situation for cumuloform shower development or advection of moisture at 500 mb occurs several hours before moisture moves in the 700 mb level; the final verification was 89%. At Fort Huachuca the critical dew point was plus 9°C with an accuracy of 94%. No development and verification data are presented in tables. *Subject Headings:* **1. Cumulonimbus formation 2. Rainfall forecasting 3. Forecasting techniques 4. Dew point temperatures 5. Arizona.**—*I.L.D.*

10.1–178 551.509.54:551.524.7

Volevakha, N. M. and Muchnik, V. M., **K voprosu o prognozirovanii fazovogo sostoianiia osadkov i gololeda.** [The problem of forecasting the phase state of precipitation and glaze.] *Ukraine. Nauchno-Issledovatel'skiĭ Gidrometeorologischeskiĭ Institut, Trudy,* 4:36–41, **1955.** 1 tables, 3 refs.—On the basis of 600 aerological observations, the authors confirm an earlier conclusion that the phasal state of precipitation during the period Oct.–April can be determined from the height of the 0° isotherm. Data are presented on the mean height of the 0°C interval for different phase states of precipitation, the distribution of the 0° isotherm level with height for various phase states of precipitation, the distribution of the 0° isotherm level in percent, frequency (in %) of phase states of precipitation as a function of air temperature at earth's surface, frequency of liquid precipitation as a function of temperature at the earth's surface, frequency (%) of the phase state of cloud elements in stratiform clouds during different temperatures, frequency of distribution of the 0°C isotherm at different elevations during glaze formation, frequency of distribution of negative vertical gradient temperatures (earth-surface-lower level of the zero isotherm) during negative temperatures at the earth's surface and frequency (%) of glaze as a function of temperature at the earth's surface. *Subject Headings:* **1. Precipitation forecasting 2. Phase state of precipitation 3. Phase state of glaze 4. Zero isotherm.**—*I.L.D.*

10.1–179 551.509.542

§Williams, Philip, Jr. (*U. S. W. B., Salt Lake City*), **Forecasting frontal precipitation at Salt Lake City, Utah, during March and April.** Wash., D. C., U. S. Weather Bureau, Sept. 11, **1957.** 10 p. 3 figs., 3 tables, 13 refs. **DWB** (M09.54 U587ff)—The importance of forecasting snowfall amounts at Salt Lake City is discussed, and an idealized storm type described. Using two parameters, an objective system is devised for forecasting the occurrence or nonoccurrence of frontal precipitation at Salt Lake City during a 30-hr period, for the months of March and April. Two additional predictors are used to estimate precipitation amounts. Results are given in the form of percentage of hits, skill scores, and correlation coefficients, and a comparison made with staff forecasts. *Subject Headings:* **1. Precipitation forecasting 2. Objective forecasting 3. Salt Lake City, Utah.**—*Author's abstract.*

WEATHER CONTROL

See also: **Drying of sodium chloride droplets** (Toye), 10.1–285; **Supercooled stratus cloud** (Serpolay), 10.1–287; **Hail prevention experiments, France** (Soulage), 10.1–303.

10.1–180 551.509.61:551.584.4:633.51

Aĭzenshtat, B. A., **Ob izmenenii mikroklimata tselinnykh zemel' Sredneĭ Azii pod vliianiem orosheniia.** [Change in the microclimate of virgin lands of Central Asia under the influence of irrigation.] (In: Akademiia Nauk Uzbekskoĭ SSR. Institut Matematiki i Mekhaniki, **Meteorologiia i gidrologiia v Uzbekistane.** Tashkent, **1955.** p. 51–55.) **DLC**—The author summarizes the results of microclimatic studies in cotton fields and in semidesert virgin lands carried out in the Golodnaya Steppe and in the Shafrikan District adjoining the Kyzyl Kum Desert. As compared with the semidesert, the cotton field loses 18% less heat by reflected radiation, two times less heat by effective radiation during the day and receives 1.5 as much radiant heat by day. The cotton receives not only radiant heat (90%) but also advective heat from the surroundings (10%), since the temperature of the leaves is 3–5°C below the surroundings. Seventy-five percent of the heat is used in transpiration, 16% by evaporation from the soil surface and 10% for heating the soil. The difference of temperature between the air over the semidesert and over the cotton field at 1.5 m is 4°C and more during the day; at 25 cm the air temperature in the cotton field is 7–8°C lower than that over the semidesert. At night the air temperature of the cotton field is 1–4°C lower than that of nonirrigated soil. The absolute humidity over a cotton field at 1.5 m is 20 mb; at 25 to 50 cm it attains values as much as 30 mb. The role of wind velocity in influencing the microclimate and the significance of irrigation in forming the climate near the ground are discussed. *Subject Headings:* **1. Microclimatic control 2. Irrigated fields 3. Field microclimatology 4. Cotton fields 5. Asiatic U.S.S.R.**—*I.L.D.*

10.1–181 551.509.61

Houghton, Henry G. (*Massachusetts Institute of Technology*), **Present position and future possibilities of weather control.** *American Meteorological Society, Bulletin*, 38(10):567–570, Dec. **1957. DWB, DLC**—Tentative results of research on weather control (cloud seeding, fog dispersal, etc.) and possible avenues for future research and development in this and other fields of meteorology, with emphasis on pure research, are discussed at some length. *Subject Heading:* **1. Weather control.**—*M.R.*

10.1–182 551.509.612 551.578.4:531

Fukuta, Norihiko (*Chemical Inst., Nagoya Univ., Japan*), **Experimental investigations on the ice-forming ability of various chemical substances.** *Journal of Meteorology*, 15(1):17–26, Feb. **1958.** 5 figs., 2 tables, 3 refs. **DWB, DLC**—A careful survey of the methods for measuring ice nucleation was made. Errors of previous investigations based on the relationship between the time lag of ice formation and the falling velocity of ice particles through a temperature gradient zone were avoided. Experiments were made on a large number of chemicals by using a thermostat-type cloud chamber, the threshold temperatures for ice nucleation of these chemicals were determined precisely and found to be somewhat higher than those of previous workers. Analysis of the experimental data shows the following: 1) the highly effective nuclei are all insoluble in water; 2) particles with the greatest structural similarity to ice make the most effective nuclei; 3) the stronger the ionic nature of nuclei crystals, the more effective they are as ice nuclei. These latter two factors are mutually interdependent. An explanation of the mechanism of ice formation is presented. *Subject Headings:* **1. Ice nucleation 2. Ice mechanics.**—*Author's abstract.*

10.1–183 551.509.616:551.574.2:629.135

Smith, E. J.; Heffernan, K. J. and Thompson, W. J. (*all, Div. of Radiophysics, Commonwealth Scientific & Indust. Res. Organiz., Sydney, Australia*), **The decay of the ice-nucleating properties of silver iodide released from an aircraft.** *Royal Meteorological Society, Quarterly Journal*, 84(360):162–165, April **1958.** 2 figs., 2 tables, 6 refs. **DWB, DLC**—Silver-iodide smoke was released from an aircraft, together with a tracer of zinc sulphide, and both aerosols were detected in another aircraft. About 2×10^{14} freezing nuclei were emitted per gram of silver iodide burnt. The number of effective nuclei decreased on exposure to the air in the daytime by a factor of 1000 in two hours. At night there was no detectable decay. *Subject Headings:* **1. Cloud seeding with silver iodide 2. Silver iodide decay 3. Silver iodide from aircraft.**—*Author's abstract.*

10.1–184 551.509.617

du Chaxel, Raoul, **Les premières expériences de pluie artificielle en Afrique Equatoriale Française.** [First experiments with artificial rainfall in French Equatorial Africa.] *French Equatorial Africa. Service Météorologique, Publication*, No. 2, July **1955.** 67 p. 2 tables, 7 refs. **DWB** (M(055) F873p)—Experiments, using a mixture of 90% anhydrous NcCl and 10% pure CaCl and 0.25% MgCl, pulverized and heated with infrared rays, with diameter from 75–125μ and kept for 36 hrs at 115°C, then vibrated for 5 hrs and reheated for 84 hrs to produce crystals of the form of talc, with 1–100μ size and mean size of 5μ (much smaller than those used at Kongwa and Madagascar). Preparation at the ground and release from airplane is described, location of Basin (Dimonika) and procedures on the systematic tests of May 11, 12 and 14, 1954 inside and outside the Dimonika Basin on May 11 and 13 (14 tests in all) and occasional tests on June 14, 1954 at Brazzaville; Aug. 3, 1954 at Bangui and on Oct. 6, 1954 at Brazzaville are described in detail with synoptic and upper air conditions outlined for each of the 21 tests. Effect of altitude of seeding was also considered in tests No. 18 and 20. Similar treatment is given to the 18 tests made in Oct.–Dec. 1954 at Niari and 4 in Feb.–March, 1955 at Malolo. Methods of analysis, primary or immediate, and secondary effects were analyzed and the results of water seeding tabulated for 14 cases and for the 29 cases where salt was used; both segregated according to StCu and Cu clouds. Charts show local results on river basins and diagrams show changes in Cu cloud development with height in relation to adiabatic temp. curve. Seven cases failed to produce visible results owing to reasons given. Of the 21 Cu clouds seeded with salt, 13 produced rain, 1 virga, 6 dissipated the cloud, and 1 produced no reaction; of the 4 Cu seeded with water, all produced rain; of the

StCu seeded with water, 4 produced precip., one virga, 4 produced secondary reaction and 1 partially dissipated. Of the 6 StCu seeded with salt, one gave large drops, 3 produced secondary reactions, and 2 could not be observed. Results were observed in every case within 16 min, and often within 3 min. Seeding at 300 m above base of cloud (with salt) is recommended. *Subject Headings:* **1. Cloud seeding with salt 2. Cloud seeding with water 3. French Equatorial Africa.**—*M.R.*

STRUCTURE AND PHYSICS OF THE ATMOSPHERE

ATMOSPHERIC POLLUTION

See: **Particulate clouds** (Green, Lane), 10.1–9; **Air pollution met. manuals,** 10.1–40; **Atmos. pollution measurement techniques, Cincinnati, O.** (Gruber, Jutze), 10.1–123; **Natural ice-forming nuclei** (Soulage), 10.1–284; **Atmospheric electric field and influences of smoke, Monte Carlo** (Rouch), 10.1–349.

STRUCTURE OF THE ATMOSPHERE

10.1–185 551.510.5

Wexler, Harry (*U. S. W. B., Wash., D. C.*) and Sissenwine, Norman (*Geophs. Res. Direct., AFCRC*), **Announcement [of] extension to the standard atmosphere.** *Monthly Weather Review*, Wash., D. C., 84(9):333–335, Sept. **1956.** fig., table. **DWB, DLC**—A graph shows temperatures to 300 km according to new extension of ICAO standard atmosphere adopted by 23 U. S. scientific and engineering organizations (listed). From 0 to 32 km is called "Standard," from 32 to 75 km "Tentative Atmosphere," and from 75 to 300 km "Speculative Atmosphere" to indicate degree of reliability. Molecular-scale temperatures, real kinetic temperatures, lapse rates, molecular weights in grams/mole, and pressures in mb are given in a table for 11 standard levels from 11 to 300 km. *Subject Headings:* **1. Extension to Standard Atmosphere 2. ICAO Standard Atmosphere 3. Upper air temperatures.**—*M.R.*

10.1–186 551.510.528:551.511

Staley, D. O., **Some comments on physical processes at and near the tropopause.** *Archiv für Meteorologie, Geophysik und Bioklimatologie*, Ser. A, 10(1):1–19, **1957.** 4 figs., table, 32 refs., 7 eqs. English, German and French summaries p. 1–2. **DWB**—Temperature and moisture structure of tropopause are set out on basis of radiosonde traces at Sandpoint Naval Air Station. Radiation is then taken up and it is shown that tropopause cannot be the top of a haze layer. Long wave radiation usually smooths the temperature profile. Convection is probably unimportant and turbulent diffusion in most cases acts as a smoothing agent. Advection and vertical convergence may be important in daily changes of stability above and below the tropopause but seem unlikely mechanisms for tropopause formation. Author has in the press a theory of tropopause formation based on divergence of the turbulent enthalpy flux. *Subject Heading:* **1. Tropopause theory.**—*C.E.P.B.*

UPPER ATMOSPHERE—IONOSPHERE

See also: **Ionospheric models** (Kallmann), 10.1–28; **Geomagnetic effects** (Lepechinsky, Durand), 10.1–90; **Measurement of ionospheric winds, Domont, France** (Lejay), 10.1–125; **Diffusive separation of argon and nitrogen, Ft. Churchill, Canada** (Meadows, Townsend), 10.1–146; **Density of the Arctic upper atmosphere, Ft. Churchill, Canada** (Townsend, Meadows), 10.1–147; **Radioactive meas. devices** (Schumann), 10.1–164; **Temperatures in the high atmosphere** (Johnson), 10.1–253; **Atmosphere structure and ionospheric winds** (Delobeau), 10.1–271; **Ionospheric drift velocities** (Jones), 10.1–272; **Ionospheric drift height variations** (Jones), 10.1–273; **Ionospheric drifts, Mayaguez, Puerto Rico** (Wiewall), 10.1–274; **Sunspot effects on ionosphere** (Minnis), 10.1–337; **Atmospheric refraction** (duCastel et al.), 10.1–342.

10.1–187 551.510.535

Burkard, O. (*Inst. fur Met. und Geop., Austria*), **A new F-layer model.** *Geofisica Pura e Applicata*, Rome, 37:145–164, **1957.** 11 figs., 3 tables, 11 refs., 44 eqs. English and German

summaries p. 145. **DLC**—The model originally constructed for the F1 layer is adapted to enable an investigation of both the F layers. Essential premises are: The ionization of a single constituent of atmosphere by monochromatic radiation; a positive temperature gradient in the F1 region, a temperature—independent from height—in the F2 region and a negative temperature gradient above the height of the F2 electron-peak; furthermore during the daytime strong heating in the F2 region. It is further assumed that the rate of electron loss in the F1 layer is proportional to the square of the density of the electrons, and in the F2 layer is in simple proportion to this density. It is also assumed that this electron loss stands in proportion to the power k of the pressure p, and to the power n of the absolute temperature T, as assumed in the original F1 layer model. The above mentioned assumption as to temperature conditions are essential to an understanding of the transition from static to dynamic conditions observed in the F2 layer. During the night and in the morning the F2 layer can be treated as a static problem, movement of air-masses being of no great importance. Later in the day, however, a labile stratification of air-masses gives rise to such movement that the F2 layer can only be handled as a dynamic problem, particular attention being paid to the movement of the air. Numerous observational data are referred to in order to prove the practicability of the new model and, with the help of this model, to justify new assertions. It has been possible, for example, to calculate the yearly temperature variation at constant level in the F1 layer. A critical report upon the models, published recently by other authors, concludes this paper. *Subject Headings:* **1. F-layer models 2. Electron density in F-layers 3. F-layer temperature gradient.**—*Author's abstract.*

10.1–188 551.510.535

Gladden, Sanford C., **Letter symbols and their application in the scaling of ionospheric vertical soundings.** *U. S. National Bureau of Standards, NBS Report*, Oct. 11, **1957.** 57 p. almost entirely charts. **DWB** (M10.535 U535Le)—Sample ionograms illustrating the use of letter symbols A–Z as conventions for identifying nonnumerical characteristics used in scaling or reducing ionograms are presented. Tabular (quantitative) values with corresponding letter symbols are reproduced opposite each plate presented. These symbols are recommended by URSI, but applications cited are not necessarily uniquely valid; i.e., other interpretations might be made that would be equally valid. *Subject Headings:* **1. Ionospheric sounding scaling symbols 2. Ionograms.**—*M.R.*

RADIO METEOROLOGY

10.1–189 551.510.62:621.396.029.6

Wagner, N. K. (*Univ. of Texas, Austin, Texas*), **Occurrence of microwave index of refraction fluctuations in a converging air stream.** *American Meteorological Society, Bulletin*, 38(8):494–496, Oct. **1957.** 3 figs., ref. **DWB**—A flight on May 20, 1956, from Pittsburgh, Penna., to Scott Air Force Base, Ill., showed refractometer variations over Indiana and Illinois much greater than normal (>10 N units), considering the anticyclonic conditions with no rain, fronts or cloud penetrations (6/10 cirrus were only clouds present). Areas of divergence occurred over Ohio, and of convergence over Indiana, as shown by 4000 ft analysis chart. Evidence, including that from soundings at Dayton, indicates fluctuations were due to incomplete mixing between converging and diverging air streams with different humidity (refractive index) characteristics in the convergence zone. *Subject Headings:* **1. Refractive index fluctuations 2. Airborne refractometers 3. Refractometer measurements 4. Convergence zones 5. Indiana 6. Illinois.**—*M.R.*

RADIOACTIVITY OF THE ATMOSPHERE

See also: **Protection against radiation, 10.1–353.**

10.1–190 551.510.7

Harley, J. H., Jr. (*U. S. Atomic Energy Comm., New York*), **Program of fall-out measurements of the Atomic Energy Commission and other U. S. programs.** *International Geophysical Year*, 1957/1958, *Annals*, 5 (IGY Instruction Manual), Pt. 5:349–351, **1958. DWB**—A description is given of the history and the purpose of the precipitation and fall-out measurements that have been made by the Atomic Energy Commission since 1951. The network,

which is now in continuous operation with about 26 stations in the U. S. and 62 stations outside the U. S., could well be used for the scientific purposes of the IGY. An explanation is given of the relative advantages (simplicity of operation, low cost) and disadvantages (collection efficiency dependent on weather) of the fall-out and deposited radioactivity measured by the gummed-film method in use, and the requirement for establishing a better relationship between the results and those obtained by other methods. For the purposes of the IGY the AEC will, through the UN, assist countries participating in the program with the provision of material and the processing of samples. *Subject Headings:* **1. Radioactive fallout networks 2. Radioactive fallout measurements 3. IGY radioactivity program.**—*Author's abstract.*

10.1–191 551.510.721

Libby, Willard F. (*Commissioner, U. S. Atomic Energy Com.*), **Isotopes in meteorology.** *American Meteorological Society, Bulletin*, 39(2):65–68, Feb. **1958.** "Delivered before the American Meteorological Society, Chicago, March 20, 1957." **DWB, DLC**—Stratospheric mixing, according to studies of Project Sunshine, occurs in one or two years and over-all storage times for both Sr^{90} and C_s^{137} are both about ten years. In connection with further studies of Project Sunshine, the author discusses various results that may be obtained. These include the following: the general application of the above storage and stratospheric mixing time to non-falling constituents, the concentration of meteoric dust in the stratosphere and its possible presence in rainfall, the detection in atmospheric rainfall of amino acids generated in the stratosphere, the occurrence of tritium in the stratosphere, including its formation, residence and formation of tritium water, etc. With reference to the troposphere, where residence for particulate matter is relatively short, the author discusses the role of rain as a scavenger of atmospheric contaminants, particularly of the finest materials, the mechanism whereby fall-out material in the stratosphere is precipitated as atmospheric rain (the role of Brownian motion), the absence of latitudinal mixing in the troposphere and its effect on fallout, etc. *Subject Headings:* **1. Strontium^{90} stratospheric storage 2. Strontium^{90} fallout 3. Project Sunshine 4. Tritium.**—*I.L.D.*

MECHANICS AND THERMODYNAMICS OF THE ATMOSPHERE

See also: **Large scale diffusion** (Solot, Darling), 10.1–18; **Upper level divergence effects** (House), 10.1–170; **Tropopause theory** (Staley), 10.1–186; **Thermodynamics and nucleation** (Defay), 10.1–280.

10.1–192 551.511:551.557

Elliott, William P. (*Dept. of Oceanog., A. and M. College of Texas, College Station*), **A comparison of some approaches to the diabatic wind profile.** *American Geophysical Union, Transactions*, 38(1):21–24, Feb. **1957.** fig., 10 refs., 11 eqs. **DWB, DLC**—Several expressions for the wind profile in diabatic flow were compared with each other. Although the forms compared appear quite different, it was found that a great deal of similarity existed among them. It was concluded that accuracy of wind observations will have to be improved before it can be stated conclusively that one expression best describes the observed profiles. *Subject Headings:* **1. Diabatic flow 2. Wind profiles.**—*Authors' abstract.*

10.1–193 532.72 551.511:551.551

Mange, P. (*Roy. Met. Inst., Dept. of Radiation, Uccle, Belgium*), **The theory of molecular diffusion in the atmosphere.** *Journal of Geophysical Research*, Wash., D. C., 62(2):279–296, June **1957.** 25 refs., 19+ eqs. **DLC.** Reprinted as *Belgium. Institut Royal Météorologique, Contributions*, No. 35, **1957.** refs., etc.—The mathematical theory of minor-constituent neutral-particle diffusion is reviewed and extended to take account of diffusion in an atmosphere with linearly varying scale height. In addition, solutions are formulated for minor constituent diffusion in the presence of sinks and sources (simultaneous production). Various simplified criteria of diffusion which have been used formerly are reviewed, and a general criterion is proposed. Application of the general theory to three particular problems is briefly indicated. In the first, it is shown that under the simultaneous action of diffusion and mixing the molecular oxygen distribution above 100-km altitude must depart from a photochemical equilibrium distribution. Secondly, the downward migration of calcium continuously introduced into the

atmosphere by meteors is described; and, finally, the usefulness of the theory is shown in analyzing the downward migration of nitrogen atoms from a high-level production region. *Subject Headings:* **1. Molecular diffusion 2. Atmospheric diffusion.**—*Author's abstract.*

10.1–194 551.511

Schatzman, Evry, **Sur la pulsation d'une atmosphère composite.** [Pulsation of a composite atmosphere.] *Annales d'Astrophysique*, 19:45–50, **1956.** French and Russian summaries p. 1. **DLC.** Reprinted as *Institut d'Astrophysique, Paris, Contributions, Ser. B*, No. 143, 1958. **NNC, CU**—A composite atmosphere possesses its own period of pulsation. An isothermal atmosphere with high temperature surmounting an isothermal atmosphere with low temperature gives a passage to progressive waves. The result of this is a damping of the atmosphere's oscillations. *Subject Heading:* **1. Composite atmosphere.**—*A.V.*

10.1–195 551.511:551.574.1

Tippelskirch, H. v., **Über die Bénard-Strömung in Aerosolen: ein experimenteller Beitrag zum Modell der zellularen Konvektion.** [On Bénard flow in aerosols: an experimental contribution to the cellular convection model.] *Beiträge zur Physik der Atmosphäre*, Frankfurt a.M., 29(3):219–233, **1957.** 9 figs., 7 refs. German, English and French summaries p. 219. **DWB**—The following investigations were undertaken in the Institute for Aviation Meteorology of the Deutsche Forschungsanstalt für Segelflug in Munich-Riem (DIRECTOR PROF. H. KOSCHMIEDER). They deal with the Bénard flow in aerosols of liquids and solids. It is demonstrated that the liquid aerosol can form G- and F-cells and transitional forms. The appearance of each kind of cell is dependent on the concentration of the dispersed component of the aerosol and on the temperature at the boundaries of the convection layer. In contrast to the liquid aerosol the solid aerosol forms G-cells only. The different behavior of the aerosols is due to their different compositions. In a brief consideration of cloudiness, two basic forms of convective cloudiness are found which can be explained on the basis of the experimental results. The conclusions based on the experimental results concerning cloudiness will have to be confirmed by experimental studies of the clouds themselves. *Subject Headings:* **1. Bénard cells 2. Cellular turbulence 3. Convective cloud structure.**—*Author's abstract.*

10.1–196 551.511:551.558.21

Wurtele, M. G., **The vertical velocity pattern created by an isolated mountain.** *Schweizer Aero-Revue*, Berne, 32(12):668–672, **1957.** 6 figs., 10 refs., 2 eqs. **DLC**—The author gives the differential equation expressing an aerodynamical stream, disturbed through a small orographic wave. He gives an analytical solution based on the studies of QUENEY, HOILAND, PALM and others. This solution is illustrated by isopleths and photographs of orographic and artificial clouds. The purpose of this article is to obtain an analytic expression for the vertical velocity pattern in three dimensions in the lee of an isolated mountain and to present this in a form such that the comparison with the original two-dimensional study of LYRA will be facilitated. *Subject Headings:* **1. Lee waves 2. Vertical velocities 3. Orographic disturbances.** —*A.V.*

10.1–197 551.511.13:551.501.4

Dahler, H., **Advektive Schichtdicken- und Temperaturänderungen und drei Tabellen zu ihrer überschlagsmässigen Berechnung.** [Advective layer thickness and temperature changes and three tables for their rough estimation.] *Zeitschrift für Meteorologie*, 10(11):331–336, Nov. **1956.** 2 figs., 3 tables, 3 refs., 5 eqs. **DLC**—Without exact knowledge of hodogram, advective component can be approximated by $\left(\frac{\partial \Delta z}{\partial t}\right)\text{adv} = -\frac{f}{g}\left(\frac{v_1+v_2}{2}\right)\sin\alpha$, where v_1, v_2 are wind velocities, α=wind rotation with height, and $f=2\,w\sin\phi$. Table 1 gives values of this for $(v_1+v_2)/2$ 5–240 kt, $\alpha=5-60°$, for lat 42½° ($f=10^{-5}$ sec/m). Table 2 gives f/g for lats 90–25° and table 3 serves for calculation of $(\partial T^{\frac{1}{2}}/\partial t)_{\text{adv}}$ from table 1 for various pressure differences. Examples of calculations are given. *Subject Headings:* **1. Advection 2. Computation tables.**—*C.E.P.B.*

10.1–198 551.511.3

Di Benedetto, Felice, **Analysis of the vorticity and divergence of the thermal wind in pure geostrophic flow.** *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A*, 10(1):20–28, **1957.** 4 refs., 42 eqs. English, German and French summaries p. 20–21. **DWB**—By applying the horizontal del operator to the thermal wind equation in vectorial form and considering only horizontal geostrophic motion, expressions are found for the vorticity and divergence of thermal wind. It is shown that vorticity, in the case of pure geostrophic flow at all levels, depends upon four factors, namely: latitude, horizontal distribution of temperature, temperature lapse rate and divergence of horizontal temperature gradient. The divergence of the thermal wind, on the other hand, depends only upon the orientation of the mean isotherms of an isobaric layer relative to the parallel circles. These terms are evaluated and it is shown that the latitude term and the lapse rate term are far greater than the remaining terms of the vorticity equation for geostrophic flow. A criterion is then given which enables to determine the conditions for irrotational horizontal motion with vertical geostrophic wind shear. *Subject Headings:* **1. Vorticity 2. Divergence.**—*Author's abstract.*

10.1–199 551.511.6:551.551

Landers, Holbrook (*Fla. State Univ., Tallahassee*), **A small-scale feature in the field of motion.** *American Meteorological Society, Bulletin*, 38(3):130–133, March **1957.** 5 figs., 3 refs. **DWB, DLC**—Simultaneous ascent of 3 balloons, released at the vertices of a triangle with an area of about ½ sq mi, serves as a basis for determining small-scale vorticity and divergence. A section of one triple-balloon run showed divergence values much larger than any of the other runs. An investigation of this run showed that it was possible to justify the large values in terms of the small-scale local wind variations. Also the small-scale local wind variations could be shown to be consistent with the large scale wind pattern over an extended area. The data were obtained in Tallahassee, Fla. during the summer of 1954. The run in question was made at 1500Z June 6, 1954. *Subject Headings:* **1. Triple balloon runs 2. Vorticity calculations 3. Divergence calculations 4. Upper air winds 5. Tallahassee, Fla.**—*M.R.*

10.1–200 551.511.6:530.162

Philip, J. R. (*Div. of Plant Industry, C.S.I.R.O., Deniliquin, N.S.W.*), **Numerical solution of equations of the diffusion type with diffusivity concentration-dependent, Pt. 2.** *Australian Journal of Physics*, Melbourne, 10(1):29–42, March **1957.** 2 figs., 8 refs., 9 eqs. **DLC**—A new procedure is developed for the numerical solution of the equation

$$\frac{\partial\theta}{\partial t} = \frac{\partial}{\partial x}\left(D\frac{\partial\theta}{\partial x} - \frac{\partial K}{\partial x}\right),$$

with D and K single-valued functions of θ and the conditions $\theta=\theta_n$, $t=0$, $x>0$; $\theta=\theta_0$, $x=0$, $t\geq 0$. Difficulties inherent in the one method previously suggested are avoided, the problem being reduced to one of solving a set of ordinary differential equations. The solution is found in a form implicit in θ and t, with x expressed as a power series in $t^{\frac{1}{2}}$ with the "coefficients" functions of θ obtained as the solution of the ordinary equations. For problems of interest to the author this series converges rapidly, so that solution of only the first few ordinary equations is needed. A simple and rapid numerical process is given for solving these equations. The truncation error of this process is studied empirically and the convergence of the power series in $t^{\frac{1}{2}}$ examined briefly. *Subject Heading:* **1. Diffusion equations.**—*Author's abstract.*

10.1–201 551.511.6

Wexler, Raymond, **Advection and the melting layer.** Blue Hill Meteorological Observatory, Contract AF 19(604)-950, Meteorological Radar Studies, No. 4, May 31, **1957.** 12 p. 5 figs., 6 refs., 12 eqs. **DWB**—A natural lapse rate of saturated air in the melting layer is found to be approximately 100 km^{-1}. The ascent or descent of the melting layer is derived for different initial lapse rates, precipitation intensities and rates of advection of warm air. The radar records show that widespread rain is most frequently accompanied by warm air

advection. During such cases there is generally an initial descent of the melting layer, caused by evaporation and cooling by melting snow, followed by a rise of the melting layer. Turbulence should be experienced in the lower portion of and just below the melting layer. *Subject Headings:* **1. Advection 2. Melting layer.**—*Author's abstract.*

GENERAL CIRCULATION

See also: **Biog. of V. Bjerknes,** 10.1–4; **Jet stream navigation** (Hawkes), 10.1–100; **Temp. rhythms, Spitsbergen and Jan Mayen** (Simojoki), 10.1–246.

10.1–202 551.513:551.515.73

Bradbury, Dorothy L. (*Univ. of Chicago*), **On the behavior of cyclones and anticyclones as related to zonal index.** *American Meteorological Society, Bulletin,* 39(3):149–151, March **1958.** 4 figs., 2 refs. **DWB, DLC**—Forty years of historical weather maps for Dec.–Feb. and June–Aug. (1899–1939) were used to compute the mean monthly sea level zonal index from 35°–55°N. The 30 out of 120 months in each season nearest to normal were eliminated and the remaining 90 months classified as high or low index. Then the frequency of cyclones and anticyclones for each 5° square was computed for high and low index situations and the figures reduced to percentage frequencies and ratios. Charts show distribution of ratios; concentration of high ratios of cyclones to anticyclones occurs in winter over the Pacific N. of 50° and over the Eastern Atlantic from 45°N to 70°N during high index and over the Western North Atlantic during low index situations. In the Mediterranean, cyclones are most frequent during low index months. In summer patterns are similar but not so well defined but show a tendency for cyclones at higher latitudes during high index and at lower latitude during low index months. Anticyclone frequencies are in general reversed from cyclone frequencies. *Subject Headings:* **1. Cyclone frequencies 2. Anticyclone frequencies 3. Cyclone-zonal index relationships 4. Northern Hemisphere.**—*M.R.*

10.1–203 551.513:551.553.12

Kasymova, K., **Rezhim gorno-dolinnoĭ tsirkuliatsii v verkhov'iakh reki Kzyl-Cha.** [Regime of the mountain-valley circulation in the upper reaches of the Kzyl-Cha River.] (In: Akademiia Nauk Uzbekskoĭ SSR. Institut Matematiki i Mekhaniki, **Meteorologiia i gidrologiia v Uzbekistane.** Tashkent, **1955.** p. 213–218. 2 figs., 4 tables.) **DLC**—The meteorological data collected in the Kzyl-Cha Valley during 1953 in connection with a study of the variation of the meteorological elements in this area and the mountain valley circulation are presented and analyzed. The data include the following: mean hourly velocity of the valley wind by day at heights from 0.1 to 8.0 km, differences in the velocity of the valley wind (lower point-upper point) involving difference of velocities at similar levels over the earth's surface and differences at similar levels in the atmosphere, mean hourly velocities of the night wind, dates of appearance and vertical thickness of easterly flow over Kzyl-Cha. The thickness of the layer on which a valley wind develops is on the average of 1.0–1.5 km. The following layers can be determined for valley winds: with a constant direction of southerly wind at 0.5–0.6 km; with south-westerly direction at 0.6–0.7 km and general circulation with an almost constant westerly or WSW wind beginning at approximately 1.0–1.5 km over the earth's surface. The maximum velocity of the valley wind occurs during the day. The valley wind occurs both on clear and cloudy days. The mountain wind is variable in the Kzyl-Cha Valley; its upper limit does not exceed 0.1–0.2 km. The velocity of the mountain wind at 0.1 km is 1–2 met/second. *Subject Headings:* **1. Mountain-valley circulation 2. Mountain-valley wind patterns 3. Kzyl-Cha Valley, U.S.S.R.**—*I.L.D.*

10.1–204 551.513.1:551.555.1

Charnock, H., **Vertical transfer of momentum in the trades (Summary).** *I.U.G.G. Association of Meteorology, Rome, Sept. 1954, Scientific Proceedings.* London, Butterworth, **1956.** p. 413. **DWB**— A summary of a paper dealing with the studies on wind structure in the lowest 1500 m carried out at Anegada in the British Virgin Islands during the spring

of 1953. The vertical transport of momentum was decreased in relation to mean wind structure and the horizontal field of pressure and the statistics of large scale fluctuations. *Subject Headings:* **1. Vertical transfer of momentum 2. Trade winds 3. Anegada, Virgin Islands.** —*I.L.D.*

10.1–205 551.513.1

Palmén, Erik Herbert, **Contribution to the theory of the general atmospheric circulation.** *Finska Vetenskaps-Societeten, Helsingfors. Commentationes Physico-Mathematicae*, 5(4), **1950.** 24 p. 3 figs., 22 refs., 20 eqs. **DLC**—A major study of the general circulation for the case of axial symmetry following EXNER (1925) and BJERKNES et al. (1933). After a general review of the subject, the transfer of angular momentum in the atmosphere, the dynamics and structure of the westerlies, the circulation cell in the stratosphere (with a meridional circulation opposite to trap circulation), the Arctic circulation and the difference between N. and S. Hemispheric circulation. Conclusion is that the meridional transfer of angular momentum necessary to maintain the momentum of the westerlies is possible if the deviation from geostrophic balance due to the internal friction in the free atmosphere is considered. It is also stated that if the coefficient of eddy viscosity in the vertical is 50 g/cm/sec or more the effect on the circulation is considerable. If it is less, the effects are of secondary importance. Large scale disturbances and lateral friction and mixing cannot be ignored. *Subject Headings:* **1. General circulation theory 2. Angular momentum transfer 3. Meridional circulation.**—*M.R.*

10.1–206 551.513.1

Van Mieghem, Jacques, **On the existence of mean meridional circulations.** *Germany. Deutscher Wetterdienst, Berichte*, 4(22):124–125, **1956.** fig., 12 refs., 3 eqs. **DWB, DLC**—The author demonstrates mathematically that a mean meridional circulation exists only when the divergence of the meridional eddy transfer $\overline{R\rho u''v''}$ of angular momentum is not compensated on the average by the convergence of the vertical eddy transfer $\overline{R\rho u''w''}$ or vice versa, and reviews various studies on momentum flux and meridional transfer. *Subject Headings:* **1. Mean meridional circulation 2. Meridional momentum flux 3. Meridional eddy transfer.**—*I.L.D.*

10.1–207 551.513.2:551.557.5

§Barbé, G. D., **Données numériques sur quelques courants "jets" mesurés au-dessus de la région Parisienne au cours de l'année 1956.** [Numerical data for a number of jet streams, measured over the Paris area during 1956.] *La Météorologie*, Paris, Ser. 4, No. 44:339–354, Oct./Dec. **1956.** 11 figs. French, English and Spanish summaries p. 339–340. **DWB**—A detailed synoptic study of the characteristics of three distinct jet streams observed over the Paris area in 1956. Observations were made with automatic radar equipment with a wave length of 10 cm. The author used the transverse wind (component of the wind perpendicular to the direction radar balloon) which provides details on the rotation with altitude of the jet wind vector within the jet stream. The local characteristics of the jet streams were studied, including numerical data on maximum wind velocity, altitude of maximum wind velocity, vertical gradient of the wind, vertical thickness of the jet streams, variability of the wind velocity in the jet, rotation of the wind vector in the interior of the "jet," characteristic clouds of the jet stream, etc. Diagrams illustrating these various characteristics of the jet stream and graphs showing the variation of wind velocity as a function of altitude and a cross section of the "jet" made with successive soundings are presented. The jet stream is inclined along its axis and wind direction toward the ground; a wind with a given velocity is situated at a lower altitude at Trappes than at London, also the vertical wind gradient is stronger above than below the layer where the wind is a maximum. *Subject Headings:* **1. Jet stream analysis 2. Triple jet streams 3. Paris, France.**—*I.L.D.*

10.1–208 551.513:551.515.8

Bergeron, T., **Multiple frontal systems as links in the general atmospheric circulation (summary).** *I.U.G.G. Association of Meteorology, Rome, Sept. 1954, Scientific Proceedings.*

London, Butterworth, **1956.** p. 289. **DWB**—In this summary of a paper delivered at the conference it is pointed out that "in winter there should be at least one more 'step' between Pole and Equator than the system of Polar fronts (P.F.)." The existence of an Arctic front (A.F.) system is confirmed. The properties of the A.F. system seem to be analogous in higher latitudes to the P.F. system, forming one more or less continuous and high-reaching circumpolar system, or two well-defined systems corresponding to the upper air "cold poles" of the Arctic. The A.F. and P.F. systems might fuse. Each front system carries its jets along with it. *Subject Headings:* **1. General circulation 2. Polar fronts 3. Frontal circulation.**—*I.L.D.*

10.1–209 551.513.2:551.557.5

Dahler, H., **Zur Entstehung des Jetstreams und einige Folgerungen.** [Formation of the jet stream and some deductions.] *Meteorologische Rundschau*, 10(3):93–101, May/June, **1957.** 5 figs., 8 tables, 14 refs. **DWB**—The confluence theory of the jet stream put forward by J. Namias and P. F. Clapp states that confluence is indicated by upglide clouds and rain in the neighborhood of a cold front, where on the cold side of the upper current winds are deflected to the left, and on the warm side to the right. The hitherto little regarded deflections with height in the upper troposphere and the strong winds lead to changes of thickness of layers which explain the jet stream. An advection of cold or warm air is sufficient. Numerical examples are given and support the idea that jet stream formation is associated with single or double confluence. Divergence in the jet stream or frontal delta only causes cyclogenesis when the advection of cyclonic vorticity is connected with warm air advection. A practical consequence is the necessity for a dense and accurate radar network for measurement of upper winds. *Subject Heading:* **1. Jet stream theory.**—*Based on author's abstract.*

10.1–210 551.513.2:551.524.7

Defant, F., **Characteristic meridional temperature profiles and their changes during high and low index types of the general circulation.** *I.U.G.G. Association of Meteorology, Rome, Sept. 1954, Scientific Proceedings*, London, Butterworth, **1956.** p. 302–304. 3 refs. **DWB**—The author examines the inner mechanism of periods characterized by the transformation from one to the other main type of zonal circulation index, the change occurring not simultaneously in all parts of the Northern Hemisphere but rather in a more successive way. Well defined profiles of temperature were obtained by averaging the temperatures of regions occupied by cold upper troughs and regions containing warm ridges. The temperature changes recurring during the transition periods from low to high index and converse are obtained by comparing selected meridional temperature profiles. The characteristics of these profiles for both types of indexes and the atmospheric circulation processes associated with these transitions are described with special reference to the Atlantic, European and Arctic sector. *Subject Headings:* **1. Circulation indexes 2. Temperature profiles 3. Meridional temperature profiles 4. Northern Hemisphere.**—*I.L.D.*

10.1–211 551.513.2:551.511.32

Yeh, Tu-cheng (*Academia Sinica*) and Dunn, Gen-yun (*Peking Univ.*), **The mean meridional circulation and angular momentum balance in the atmosphere.** *Scientia Sinica*, Peking, 6(2):339–346, April **1957.** 4 figs., 14 refs. **DLC.** "First published in Chinese in *Acta Meteorologica Sinica*, 27(4):307–321, **1956.**" **DLC**—The mean meridional winds of 1950 along different latitudes from 1000 to 100 mb given by H. S. Buch (1954) and for the oceans by (Riehl and Yeh) are used to determine the mean meridional circulation. Three cells are shown: 2 in low and high latitudes and 1 in mid-latitudes. The Hadley cell is about 30° lat. in extent, the Polar cell 40° lat. and the mid-latitude cell about 15°. The mean meridional circulation is less intense in summer and more intense in winter. The angular momentum balance and the maintenance of the zonal circulation are discussed at some length for 1950, and data given in a table and cross section. It is thought that quasi-horizontal gross disturbances are important in middle and high latitudes, but in low latitudes where the coriolis force is small, the mean meridional circulation is important. *Subject Headings:* **1. Mean meridional circulation 2. Angular momentum balance. I. Buch, H. S.**—*M.R.*

ATMOSPHERIC DISTURBANCES

See also: **Typhoon forecasting, China** (Gherzi), 10.1–24; **Hurricane, Galveston** [Sept. 1900] (Weems), 10.1–35; **Thunderstorm frequencies, U.S.S.R.** (Arkhipova), 10.1–37; **Thunderstorm and climatological records, U. S. W. B.** (Baliles), 10.1–65; **Aeronaut. climat., W. & Eq. Africa** (Welter, Suraud), 10.1–98; **Aircraft tornado reconnaissance** (Beebe), 10.1–144; **Hurricane reconnaissance instrumentation** (Hilleary, Christensen), 10.1–158; **Synoptic conditions for tornadoes, Moscow** (Kolobkhov), 101.–165; **Storms on Lake Issyk Kul, U.S.S.R.** (Riaguzov), 10.1–166; **Typhoon movement forecasting** (Hashimoto), 10.1–168; **Hurricane movement forecasting** (Hoover), 10.1–169; **Upper level divergence effects** (House), 10.1–170; **Cold wave forecasting, So. Alberta, Canada** (Buckler), 10.1–171; **Thunderstorm rainfall, Kanto District, Japan** (Otsuka), 10.1–175; **Cyclone-zonal index relationships, Northern Hemisphere** (Bradbury), 10.1–202; **General and frontal circulation** (Bergeron), 10.1–208; **Hurricane damage to forests, New England** (Spurr), 10.1–268; **Jet-streams and polar front** (Bessemoulin, Viaut), 10.1–275; **Floods, Naugatuck, Conn.,** Aug. 1955 (Bordne), 10.1–306.

10.1–212 551.515:551.557:551.577

Newton, C. W. (*Univ. of Chicago*), and Katz, Sey (*U. S. A. F.*), **Movement of large convective rainstorms in relation to winds aloft.** *American Meteorological Society, Bulletin,* 39(3):129–136, March **1958.** 7 figs., 10 refs. "Based on thesis by Katz for M.Sc." **DWB, DLC.** Also issued in: Chicago Univ. Dept. of Meteorology, Contract Cwb-8950, Final Report, **Pt. 2,** issued **1957.** 7 p. 6 figs., 9 refs. Carbon of typescript. **DWB** (M15 C532fi)—By means of hourly rainfall data from the Hydroclimatic Network, the motions of large rainstorms, of the kind associated with squall lines, are examined in relation to the winds aloft. Very little correlation is found between the speed of movement of the rainstorms and the wind speed at any level, although the fastest moving storms were associated with strong winds aloft. Significant correlation is found between direction of motion of rainstorms, and wind direction at 700 mb or higher levels. On the average, the rainstorms move with an appreciable component toward right of the wind direction. The difference between these results, and those from other studies based on small precipitation areas, is ascribed to propagation. The mechanism involved is discussed briefly. *Subject Headings:* **1. Convective rainstorm movement 2. Rainstorm movement—winds aloft relationships.**—*Authors' abstract.*

10.1–213 551.515:551.511.3

§Uwai, K., **On the structure of atmospheric disturbances at initial stage in low latitudes. (On atmospheric disturbances in low latitudes, Pt. 2).** *Journal of Meteorological Research,* Tokyo, 9(6):407–412, July **1957.** 6 figs., 8 refs. **DWB**—In this paper the author analyzed synoptically the aerological data in low latitudes and obtained the following results on the initial stage of atmospheric disturbance: (1) The magnitude of each term in vorticity equation is of the same order near the disturbance in lower layer and to neglect the baroclinic term is not rational. In upper layer the advective term becomes larger and the baroclinic term negligibly small. (2) The I.T.C. is a cold trough and its intensity increases up to some height, then decreases with height and nearly disappears at 300 mb level. The baroclinic term in vorticity equation is positive along the trough line, while it is negative at the south side of trough line in upper layer and positive at its north side. The same result is obtained from the vertical distribution of cold core intensity. The convergence area corresponds to the low temperature area and the intensity of convergence increases up to some height, from which upwards it decreases. This distribution of vorticity agrees with the rainfall distribution. Above 300 mb level the cold core becomes remarkable again, probably due to another disturbance aloft. The axis of trough line inclines southward with height up to about 300 mb level, above which it seems to incline northward by another disturbance aloft. (3) The equatorial westerly wave is also a cold trough and the distribution of its intensity with height is the same as the former disturbance. The axis of trough line inclines westward with height. The baroclinic term is positive at the west side of ridge line and negative at the east side, which agrees with the rainfall distribution. (4) The easterly wave is also the same cold trough as the former. The baroclinic term is positive at the east side of trough line and negative at the westside, which agrees with the rainfall distribution. The axis of trough line inclines usually eastward, but it seems to become reverse in case of unstable upper disturbance. The calculated distribution of

vertical velocity expresses the downward current ahead of the trough line and upward current back of the trough line. *Subject Headings:* **1. Structure of disturbances 2. Low latitude disturbances 3. Trough structure.**—*Author's abstract.*

10.1–214 551.515:551.543

Uwai, K., **Generation of pressure trough and formation of low (On atmospheric disturbance in low latitudes, Pt. 3).** *Journal of Meteorological Research*, Tokyo, 9(7):467–474, July **1957.** 11 figs., ref., 4 eqs. In Japanese, English summary p. 467. **DWB, DLC**—In this paper the author discussed the mechanism of a pressure trough as the first stage of formation of disturbance and then the formation of closed isobar and obtained the following results: (1) In equation (1) of pressure change the term $1/f$ curl $p_h V$ is largest and the pressure change by this term is shown graphically as Figs. 1 and 2. A synoptic example is shown in Figs. 3 and 4. (2) The change of wind situation or pressure pattern in upper troposphere seems to be due to the advection of air in stratosphere as shown in Fig. 5. (3) Remarkable pressure fall will be caused by the distribution of curl $p_h V$ (Figs. 6–9) at the intersecting area between the I.T.C. and the easterly wave or equatorial westerly wave. The change of vorticity with time becomes positive in lower layer and negative in upper layer near that area. It will be due to the fact that the first term and second term of equation (2) cancel each other, and the third and fourth terms become effective. (4) As there is no remarkable pressure falling area in the single easterly wave or equatorial westerly wave, we must suggest another cause of pressure fall such as the strong southerly wind in upper layer, where the relative vorticity takes the large negative value and $\zeta+f$ can be smaller, and the first and second term in equation (3) become the same sign and can take larger negative value and so $d\zeta/dt$ can take large negative value in upper layer. (5) The fact that the atmospheric disturbance has cold core in lower layer and its intensity increases with height up to some height and then decreases may be explained by the proper distribution of cyclonic curl $p_h V$ due to the change of advection after the formation of trough. *Subject Headings:* **1. Low latitude disturbances 2. Troughs 3. Pressure variations.**—*Author's abstract.*

10.1–215 551.515.11:551.515.2

†§Khan, Mohammed Ibrahim, **A study of structure, behaviour and effects of tropical cyclones in West Pakistan. 1957.** Thesis (M.A.)—Karachi Univ., Pakistan. Photostat of typescript. More than 127 p. (paging obliterated). tables, 24 refs. **DWB** (M15.2 K45st)—An extensive study of the life history, structure, frequency, area of formation and rainfall, floods, etc. of tropical cyclones of the Bay of Bengal and of the Arabian Sea affecting West Pakistan. Considerable flood, rainfall and cyclone frequency data for West Pakistan are included and discussed. Seasonal (or monthly) effects are brought out in detail in discussion. *Subject Headings:* **1. Tropical cyclones 2. Cyclone structure 3. Cyclones, Bay of Bengal 4. Cyclones, Arabian Sea 5. West Pakistan.**—*M.R.*

10.1–216 551.515.13

§Krishna Rao, P. and Gleeson, Thomas A., **Example of cyclogenesis in the Mediterranean Region during winter.** Florida. State Univ. Dept. of Meteorology, Contract AF 19(122)-466, Scientific Report, No. 10, June 15, **1957.** 15 p. 11 figs., 5 refs. **DWB** (M82.1/262 F636s)—A case of cyclogenesis (19 December 1950) in the western Mediterranean region is described with use of surface and 500-mb synoptic maps. The analysis shows that the cyclone formed with the entrance of cool polar maritime air into the region and with a stationary trough aloft. These conditions are regarded as typical for cyclogenesis in that area. Scarcity of data at upper levels precluded effective analysis of vorticity, advection, stability, and vertical cross sections. A brief discussion is given of the weather associated with the cyclone. *Subject Headings:* **1. Cyclogenesis 2. Mediterranean Region.**—*Authors' abstract.*

10.1–217 551.515.13:551.509.311

§Miles, M. K., **Synoptic study of thermal troughs over the Atlantic and the British Isles.** *Meteorological Magazine*, 87(1027):1–12, Jan. **1958.** 7 figs., 2 tables, 6 refs. **DWB, DLC**—A study of thermal troughs over the North Atlantic and the British Isles during 1954 shows

that on the average there are about 12 distinct troughs during each month. If July is excepted, because many of the troughs during this month were small distortions of a large quasistationary trough, it appears that there are significantly fewer troughs in summer than in winter. Nearly 90% of all thermal troughs can be classified into four main types, namely (1) medium to long wave structure, (2) cyclonic tongue or cyclonic thermal involution, (3) new troughs formed in a developing northerly flow behind an intensifying depression, often in a meridional or "blocked" situation and (4) "break away" troughs. About one-third already existed in a fairly mature state (type) when they entered the area of study, and nearly as many (excluding cyclonic involutions) have formed by cold advection within the area (type 3). The cyclonic involutions (type 2) are almost invariably associated with katafronts. Type 2 troughs were much more frequent in winter than in summer. The fourth and smallest class of troughs are those which split off from a larger trough and have a very high speed. The summer and winter months with their highest frequency of meridional and blocking situation show a significantly smaller number of mature troughs. Summer troughs tend to give rise to coincident surface isobaric troughs. The characteristics of the frontal types are outlined and described with the aid of synoptic diagrams. *Subject Headings:* **1. Thermal troughs 2. Trough frequencies 3. Trough types 4. Synoptic studies 5. North Atlantic 6. Great Britain.**—*I.L.D.*

10.1–218 551.515.1:551.577

Kessler, Edwin, III (*Geophys. Res. Direct., A. F. C. R. C., Mass.*), **Outer precipitation bands of hurricanes Edna and Ione.** *American Meteorological Society Bulletin*, 38(6):335–346, June 1957. 10 figs., 2 tables, 8 refs. **DWB, DLC**—Hurricanes Edna, 1954, and Ione, 1955, were observed by radar at South Truro, Mass. Both storms are associated with convective shower bands near the northern extremities of their circulations. Shower characteristics in the two cases are virtually identical in most respects, but the bands which they comprise propagate in grossly dissimilar ways. The differences are attributed to the presence of a convergence line or zone (cold front) at the boundary between two large scale air streams in the case of Ione, and the absence of a corresponding feature in the case of Edna. The Ione observations are in general accord with the BJERKNES cold frontal model, as recently modified by SANDERS, in which warm air is entrained into the frontal zone and converges and rises there and above it. While the showers thereby formed move with the warm air in which they are embedded, the convergence zone moves with the winds northwest of the wind shift line. The Edna showers develop in an almost horizontally homogeneous wind field, and there is some question as to the persistence of the small scale lines of convergence which produce them. This note also contains some brief discussion of banded structures associated with altostratus clouds and rain which occurred in the outskirts of both Edna and Ione. *Subject Headings:* **1. Hurricane rainfall 2. Convective shower band 3. Precipitation bands in hurricanes 4. Radar precipitation echoes 5. Hurricane "Edna" (1954) 6. Hurricane "Ione" (1955).**—*Author's abstract.*

10.1–219 551.515.23

Riehl, Herbert (*Univ. of Chicago*) and Sanborn, Richard W. (*Bureau of Aeronautics Proj. AROWA*), **Climatology of three-day hurricane motion.** *American Meteorological Society, Bulletin*, 39(2):69–72, Feb. 1958. fig., 8 tables, ref. **DWB, DLC**—In the preparation of a climatology of three-day hurricane motion the following parameters are necessary: time of the year, latitude at which a storm is situated at the beginning of a forecast interval, the longitude of the storm and the past or current storm movement. The characteristics and roles of the various parameters are described and the hurricane tracks over the period 1901–1955 with duration of three or more days are reduced to nine class intervals when season is eliminated as a parameter. Data are presented giving the frequency distribution of hurricanes (1901–1955), mean 72-hr displacement by classes, mean seasonal displacement (degrees), mean displacement by class interval seasonal displacement removed, percent probability of verification of the climatological forecasts within given error limits for both latitude and longitude, percent frequency of verification of the climatological forecasts within given error limits, etc. Displacements in latitude were found to be less variable than those of longitude. The correction for seasonal changes of path does not introduce a uniform change of the picture. "At lower latitudes with initial direction towards the west northwest the deviations have no preferred

direction. At higher latitudes with more northerly direction, negative correlations predominate." *Subject Headings:* **1. Hurricane climatology 2. Hurricane tracks 3. Latitude effects on hurricane direction.**—*I.L.D.*

10.1–220 551.515.33(773)

Changnon, S. A., Jr. and Stout, G. E., **Tornadoes in Illinois.** *Illinois. State Water Survey Div., Circular,* No. 63, **1957.** 11 p. 6 figs., table, 4 refs. **DWB** (M15.3 C433t)—This report discusses some of the climatological facts concerning tornadoes occurring in Illinois. Its purpose is to investigate the frequency of tornadoes in Illinois and to evaluate the resulting loss in lives and damage to property. The tornado climatology of all states is reviewed for comparison with Illinois. The states are ranked according to number of tornadoes and deaths and damage caused by tornadoes. Tornadoes in Illinois are investigated in relation to their occurrence by area, by hour, and by season. They are also discussed according to their severity and to their physical characteristics. *Subject Headings:* **1. Tornado occurrence 2. Tornado frequencies 3. Tornado climatology 4. Tornadoes, Illinois 5. Illinois.**—*Authors' abstract.*

10.1–221 551.515.3 551.556.4(661)

Lacaze, J., **Les tourbillons de sable du Sahara.** [Sand devils in the Sahara.] *Puy de Dôme. Observatoire, Bulletin,* No. 1:19–22, Jan./March **1958.** 5 refs. **DWB**—The author relates the conditions of observation of the sand whirls in the Sahara. He describes the single whirl, the double whirl, the associations of whirls and the meteorological conditions of their existence. A sand whirl with vertical axis can be defined as an uplift of sand in the shape of a helicoidal band wound on a vertical, practically circular cylinder, except in the immediate vicinity of the ground. Localizations and advancings of whirls are also investigated. The sand whirls illustrate a very particular mode of convection. *Subject Headings:* **1. Dust devils 2. Convection 3. Sahara.**—*A.V.*

10.1–222 551.515.7:551.524(52)

Yoshino, I., **On the development of Siberian high in November, 1952 and the persistence of low temperature over Japan during early December, 1952.** *Journal of Meteorological Research,* Tokyo, 10(1):23–33, **1958.** 17 figs., 7 refs. In Japanese; English summary p. 23. **DWB, DLC**—This report is a case study on the development of Siberian High in Dec., usually in connection with persistent low temperature over Japan during this period, from synoptical viewpoint. Obtained results are: (1) an abnormal development of Siberian High is accompanied by the southward displacement of Polar High, (2) marked low temperature over Tomsk region is associated with development of the High, (3) persistent low temperature over Japan is accompanied by the following synoptic patterns, that is: (a) development of cyclone over Okhotsk Sea or Bering Sea, (b) weakness of Siberian High, with extension of the high to the southeast part of East Asia, and (c) stagnation or southward displacement of Yakutsk low temperature domain at 500 mb level. *Subject Headings:* **1. Siberian High 2. Low temperature persistence 3. Japan.**—*Author's abstract.*

10.1–223 551.515.8:551.577

§Nazarova, T. L., **O vliianii vozdushnykh mass tropicheskogo proiskhozhdeniia na vesenne-letnie osadki v Uzbekistane.** [Influence of tropical air masses on spring-summer precipitation in Uzbekistan.] (In: Akademiia Nauk Uzbekskoĭ SSR. Institut Matematiki i Mekhaniki, **Meteorologiia i gidrologiia v Uzbekistane.** Tashkent, **1955.** p. 195–199. 3 figs.) **DLC**—The spring and summer precipitation pattern in Uzbekistan is described in detail in relation to the prevailing air masses. The vertical and latitudinal distribution of precipitation in Uzbekistan, including rainfall intensity, air mass movement and orographic influences and the interaction of northerly air masses with subtropical air masses from India over Central Asia to produce the summer rainfall are discussed with the aid of synoptic charts. *Subject Headings:* **1. Air mass-precipitation relationships 2. Air mass movements 3. Tropical air masses 4. Uzbekistan, U.S.S.R.**—*I.L.D.*

RADIATION AND TEMPERATURE

RADIATION

See also: **Infrared radiation textbooks** (Smith), 10.1–8; **Geomagnetic data analysis, Sitka Alaska** (Cain), 10.1–29; **Wilson cloud chamber** (Gentner et al.), 10.1–38; **Cosmic ray stations for IGY, Canada and U.S.S.R.,** 10.1–43; **Actinometric measurements, Lwiro, Belgian Congo** (Bonnet), 10.1–127; **Night airglow luminance, Haut-Provence, France** (Cailliatte), 10.1–149; **Solar illumination change, Val Joyeux, France** (Vassy, E.; Vassy, A.), 10.1–152; **Infrared molecular attenuation** (Carpenter et al.), 10.1–235.

10.1–224 523.78:551.521

Abbott, W. N. (*Geophysical Inst., College, Alaska*), **On certain radiometric effects during the partial solar eclipse of Feb. 25, 1952.** *Geofisica Pura e Applicata*, Milan, Vol. 39:186–193, Jan./April **1958.** 3 figs., 3 tables. **DLC**—In this paper we discuss some interesting results of radiometric measurements carried out with a thermopile pyrheliometer and direct reading Gorczyński solarimeter during the eclipse of Feb. 25, 1952, which was partial in Greece, as compared to similar measurements made on the two days preceding the eclipse, under identical meteorological conditions and with a sky of uniform and exceptional purity. These data were assumed to be comparable between themselves, and from the discussion it results: a) That on eclipse day the values of the radiation measurements began to drop off well before first contact, and persisted to remain lower than those of the preceding days at the same hours, well after last contact. We attribute this phenomenon to the entrance before first contact and the lagging after last contact in the field of the instrument which possesses a field angle of 3°, of the intersection of the lunar penumbra with the optically important higher atmosphere. b) After first contact and before last contact the fractional radiative obscuration is by a factor of the order of ten larger than the fractional covered area; this is probably due to the penumbra in the atmosphere. *Subject Headings:* **1. Eclipse effects on solar radiation 2. Solar eclipse, Feb. 1952 3. Greece.**—*Author's abstract.*

10.1–225 620.92:551.521.1

Daniels, Farrington (*Univ. of Wisconsin*), **Utilization of solar energy.** *UNESCO, Arid Zone Research*, 7:129–137, **1956.** French and Spanish summaries p. 135–137. **DWB, DLC**—The utilization of solar energy is discussed from the following standpoints: its theoretical possibility, its technical feasibility, its economic and social usefulness and its political implications. This is followed by a summary of the research on the use of solar energy in the U. S., such as various ways of house heating, as the distillation of sea water or type of solar engines, on photosynthesis, on photochemistry, on photoproduction of electricity, and on storage of intermittent power, etc. *Subject Headings:* **1. Solar energy utilization 2. Solar energy research 3. United States.**—*I.L.D.*

10.1–226 551.521.1:551.576.2

Bossolasco, Mario and Castagnoli, Bianca, **La radiazione globale a Genova.** [Global radiation at Genoa.] *Geofisica e Meteorologia*, Genoa, 4(6):114–117, Nov./Dec. **1956.** fig., 5 tables, 3 refs. **DWB**—The results of global radiation recorded during the period 1951–1955 at the Institute of Geophysics and Geodesy of the Univ. of Genoa by means of a Robitzsch actinograph are analyzed and data are presented on the total monthly global radiation in kg cal/cm² for each year of the 5-year period and mean daily global radiation (cal/cm²) on clear days for each month of the period at the Univ. of Genoa and corresponding theoretical values at latitude 45°N. With the aid of Ångström's formula for calculating global radiation of a cloudy sky from that of a clear sky, the author attempts to determine whether the data collected at Genoa provide a more precise value of the coefficient η and if the relationship exists between global radiation during a clear sky and that from a cloudy sky. Monthly values of η_1, α and β and mean values of α for different degrees of cloudiness in June and Dec. for Genoa are given. By using the relative sunshine amount s/S computed from a Campbell Stokes sunshine recorder, the values η equal to 0.34 have been determined for introducing into the Ångström formula. *Subject Headings:* **1. Global radiation 2. Ångström's formula 3. Genoa, Italy.**—*I.L.D.*

10.1–227 551.521.1:551.521.3

Elnesr, Mustapha K., **Contribution à l'étude de l'énergie solaire en Egypte [Pt. 3?].** [Contribution to the study of solar energy in Egypt, Pt. 3?] *Journal Scientifique de la Météorologie*, Paris, 9(36):159–167, Oct./Dec. **1957.** 2 figs., 7 tables, 11 refs. French, English and Spanish summaries p. 159. **DWB**—This article deals with rain conditions, aerosols (sand and dust storms), temperature and dampness. Thus, in the last section, the authors have studied estimation of direct intensity with a clear sky, taking account of molecular diffusion, absorption by ozone and atmospheric water vapor, likewise scattering by the aerosols. (For Pts. 1 and 2, *see* 9.10–188, Oct. and 9.11–211, Nov. *MAB.*) *Subject Headings:* **1. Solar radiation 2. Molecular diffusion 3. Absorption by ozone 4. Egypt.**—*Author's abstract.*

10.1–228 551.521.1:551.590.24

*Grzedzielska, Barbara and Zakrent, Stefan (*both, PIHM, Warsaw*), **Wyniki pomiarów natężenia całkowitego promieniowania słońca w Suwałkach podczas zaćmienia słońca w dniu 30 czerwca 1954 roku.** [Results of the measurements of global radiation at Suwalki during the total eclipse of the sun, June 30, 1954.] *Przegląd Geofizyczny*, Warsaw, 1(3/4):179–182, **1956.** 2 figs., table, eqs. French summary p. 182. **DWB, DLC**—Global radiation intensities measured during a solar eclipse are presented along with data on cloudiness and temperature. Times of first contact, maximum and last contact are indicated. Bad weather prevented radiation measurements other than global radiation. *Subject Headings:* **1. Global radiation measurements during eclipse 2. Solar eclipse, June, 1954 3. Suwalki, Poland.**—*G.T.*

10.1–229 551.521.1:551.508.72

O'Connor, T. C., **Further measurements of global radiation using black and white atmometers.** *Geofisica Pura e Applicata*, Rome, 38:154–156, **1957.** table, 5 refs. German and English summaries p. 154. **DLC**—The feasibility of using the difference in the evaporation from a black and a white atmometer for the continuous routine measurement of global radiation at a field station was examined. The atmometers were operated continuously for 177 days and the results obtained were compared with measurements of the global radiation for the corresponding period as given by a Bellani pyranometer. Good agreement between the monthly totals of global radiation from both methods was obtained. *Subject Headings:* **1. Global radiation measurements 2. Instrument comparisons.**—*Author's abstract.*

10.1–230 551.521.1:620.92

Trombe, Félix, **Structure des machines utilisant l'énergie solaire.** [Structure of solar energy units.] *UNESCO, Arid Zone Research*, 7:160–174, **1956.** 14 figs., 6 refs. English and Spanish summaries p. 170–172. **DWB, DLC**—A discussion of the energy output of solar radiation, the energy emitted by a blackbody at different temperatures, the capture of solar energy by fixed installations, the physical properties of the reflection and orientation of solar energy receivers, the factors affecting the focused deflection of sunlight, the use of silver backed glass and the silvering protected by an electrolytic deposit of copper, a description of an experimental unit collecting sufficient solar energy for a power yield of 75 km operating at the Solar Energy Laboratory of Mont Louis (Eastern Pyrénées), the state in which concentrated sunlight reaches the collecting surface of a parabolic mirror and a revolving paraboloid, the use of the various types of collecting surfaces, a detailed description of the Mont-Louis solar energy unit, and alternate ways of using the solar radiation concentrated at this form of the paraboloid are presented. *Subject Headings:* **1. Solar energy utilization 2. Solar furnaces.**—*I.L.D.*

10.1–231 551.521.11/2

Glover, J. and McCulloch, J. S. F. (*both, East African Agriculture and Forestry Res. Organiz., Muguga, Kenya*), **The empirical relation between solar radiation and hours of sunshine.** *Royal Meteorological Society, Quarterly Journal*, 84(360):172–175, April **1958.** 2 tables, 6 refs., 9 eqs. **DWB, DLC**—The variation with latitude of the regression parameters a and b in the conventional equation of Ångström type

$$Q/Q_A = a + bn/N$$

between total solar radiation on a horizontal surface (Q) and hours of bright sunshine (n) has been examined. It has been shown that the slope of the relationship b is effectively constant,

while the threshold value a is a function of latitude. An empirical relationship leading to the Ångström equation at each latitude ϕ over the range 0°–60° is derived and is shown to give values in reasonable accord with previous experience. It is

$$Q/Q_A = 0.29 \cos \phi + 0.52\, n/N.$$

Subject Headings: **1. Solar radiation-sunshine duration relationships 2. Ångström's formula.**—*Authors' abstract.*

10.1–232 551.521.11(71)

Mateer, C. L., **Preliminary estimate of the average insolation in Canada.** *Canadian Journal of Agricultural Science*, 35:579–594, Nov./Dec. **1955.** 16 figs., 9 refs., 11 eqs. **DLC, DA**—Charts of the estimated average insolation received over Canada during each month of the year have been prepared. In the construction of these charts, instrumental observations of insolation have been supplemented by estimates derived from empirical equations relating average insolation to average sunshine or cloudiness. In the winter months, the average insolation shows a distinct latitudinal gradient with values, in Dec., about 100 langleys per day along the southern border decreasing to zero in the region of the polar night. In the summer months, the latitudinal gradient disappears completely with, in June, areas of maximum (insolation $\geqslant$600 langleys per day) in regions of low cloudiness and areas of minimum (insolation $\leqslant$500 langleys per day) in the cloudy regions bordering on large bodies of water. *Subject Headings:* **1. Insolation charts 2. Canada.**—*Author's abstract.*

10.1–233 551.521.12:551.508.21

Ångström, Anders, **Actinometric measurements—performance and application.** *I.U.G.G. Association of Meteorology, Rome, Sept. 1954, Scientific Proceedings*, London, Butterworth, **1956.** p. 533–537. fig., 6 eqs. **DWB**—A brief review of the principles underlying the determination of the turbidity and the water content of the atmosphere by actinometric measurements is presented. The variation of incoming direct solar radiation is analyzed as a function of the variable distance between sun and earth, of molecular scattering, of scattering and absorption by liquid and solid particles in the atmosphere and of selective absorption by the atmospheric gases. The utilization of actinometric measurements for the study of biological phenomena is considered. *Subject Headings:* **1. Actinometric measurements 2. Turbidity measurement techniques 3. Solar radiation.**—*I.L.D.*

10.1–234 551.521.14

Fritz, Sigmund (*U. S. W. B.*), **Absorption and scattering of solar energy in clouds of "large water drops," Pt. 2.** *Journal of Meteorology*, 15(1):51–58, Feb. **1958.** 5 figs., 2 tables, 11 refs., eqs. "Based on a dissertation submitted to the Dept. of Meteorology, M.I.T., in partial satisfaction of requirements for the Sc.D. degree, May 1953." **DWB, DLC**—A brief description of the basic method used to compute the absorption of solar energy in clouds is given. The numerical results of computations are presented. These include: 1) the absorption in thick clouds as a function of wavelength; 2) the total absorption in thick clouds as a function of certain cloud parameters; and 3) the absorption as a function of thickness for a particular cloud. The effect of the water vapor above the cloud on absorption in the cloud is discussed; the influence of the sun's zenith distance is indicated. For some cases, the albedo of the clouds is also given. (For Pt. 1, *see* 6.2–170, Feb. 1955, *MAB.*) *Subject Headings:* **1. Absorption by clouds 2. Albedo of clouds.**—*Author's abstract.*

10.1–235 551.521.3:551.521.17

*Carpenter, Robert O'B.; Wight, Julia A.; Quesada, Antonio and Swing, Richard E., **Predicting infrared molecular attenuation for long slant paths in the upper atmosphere.** Baird-Atomic, Inc., Cambridge, Mass., Contract AF 19(604)-2405, Scientific Report, No. 1, Nov. 1, **1957.** 62 p. 19 figs., (some fold), 17 refs., 44 eqs. **DWB** (M10.53 B163s)—A simple, practical, and reliable procedure is given for the calculation of predicted infrared molecular attenuation for almost any path in the atmosphere, slant or otherwise, of any length. A detailed survey is given of the arguments as to the procedure for properly accounting for the effect of pressure broadening along paths of variable pressure and temperature. In order to calculate attenuation, it was necessary to derive accurate corrections to the ray trajectories for the curvature of the earth and the refraction or bending of light rays by the atmosphere.

These results may be useful in triangulation, sighting corrections, or other applications. All calculations are based on the ARDC Model Atmosphere 1956, and simple procedures for correcting to existing weather conditions are given. *Subject Headings:* **1. Infrared molecular attenuation 2. Pressure broadening 3. Upper atmosphere.**—*Authors' abstract.*

10.1–236 551.521.3:551.593.54

Gibbons, Mathew G. (*U. S. Naval Radiological Defense Lab., San Francisco, Calif.*), **Wavelength dependence of the scattering coefficient for infrared radiation in natural haze.** *Optical Society of America, Journal*, 48(3):172–176, March **1958.** 4 figs., 16 refs., 7 eqs. **DWB, DLC**—From the best published data, it is shown that to an approximation of $\pm 4\%$ the extinction coefficient for scattering by natural haze, when referred to its value at 0.61μ varies as $\lambda^{-0.7}$ in the region of wavelength from 0.61 to 11.48μ regardless of the visual range. It is also shown that the relationship $\sigma = k\lambda^{-0.7}$ for natural haze is consistent with the known range of sizes and indices of refraction of natural haze particles and their scattering area coefficients as given by the Mie theory. The possibility of this relationship holding also in ordinary smog is indicated. *Subject Headings:* **1. Extinction coefficient of haze 2. Mie theory.** —*Author's abstract.*

10.1–237 523.77:551.521.326

Allard, N., **Interféromètre de Fabry-Perot enregistreur pour l'étude de la raie verte du ciel nocturne.** [Recording Fabry-Perot interferometer for the study of the green night-sky line.] *Journal de Physique et le Radium*, Paris, 19(3):340–341, March **1958.** fig. French and English summaries p. 340. **DLC**—A photo-electric Fabry-Perot spectrometer, designed for study of the width of the green night-sky line (3/2 [O_1]5 577 Å), is presented together with a description of the interferometer and its use as an easily portable device for the purpose of observing at different stations. *Subject Headings:* **1. Fabry-Perot spectrometer 2. Green night-sky line.**—*Author's abstract.*

10.1–238 523.77:551.521.326:551.594.5

Armstrong, E. B., **Largeur de la raie OIλ5 577 du ciel nocturne et des aurores.** [Width of the line OIλ5 577 of the airglow and aurorae.] *Journal de Physique et le Radium*, Paris, 19(3):358–365, March **1958.** 7 figs., 2 tables, 14 refs. French and English summaries p. 358. **DLC**—Observations of the OI green line profiles in the airglow and aurorae, made with a photoelectric Fabry-Perot interferometer, are described. The temperature of the region emitting the airglow radiation appears to be between 180°K and 220°K, the most likely value indicated being 190°K. Auroral regions emitting the green line appear to range in temperature from 255°K to 540°K. A method of estimating line widths from fringes in the presence of background light is described. *Subject Headings:* **1. Fabry-Perot interferometer 2. Airglow 3. Auroras.**—*Author's abstract.*

10.1–239 551.521.326

Barbier, D., **La lumière du ciel nocturne en été à Tamanrasset.** [Nocturnal sky light at Tamanrasset during summer.] *Académie des Sciences, Paris, Comptes Rendus*, 245(18): 1559–1561, Oct. 28, **1957.** 2 tables, 3 refs. **DLC**—The behavior of nocturnal sky light is passably different at Tamanrasset and in High-Provence. A particular phenomenon manifested through the red ray has been displayed at the first mentioned station. *Subject Headings:* **1. Nocturnal sky light 2. Tamanrasset, Algeria.**—*A. V.*

10.1–240 551.521.326

Bates, D. R. (*Queen's Univ. of Belfast*), **The airglow.** (In: Bates, D. R., (*ed.*), **The Earth and its atmosphere.** N. Y., Basic Books, **1957.** p. 223–230. fig.) **DLC**—The nightglow—its spectrum, seat of luminescence, theory of origin, twilight airglow and dayglow and artificially produced airglows are discussed for popular understanding. *Subject Heading:* **1. Airglow.** —*M. R.*

10.1–241 551.521.326

Dufay, Maurice, **Sur les intensités des bandes d'émission du ciel nocturne dans le proche infrarouge.** [Intensities of the emission bands of the nocturnal sky in the near infra-red.]

Académie des Sciences, Paris, Comptes Rendus, 246(15):2281–2283, April 14, **1958.** 2 figs., 6 refs. **DLC**—The recordings of the spectrum of nocturnal sky in the near infra-red by means of a monochromator with revolving grid followed by a photomultiplier allowed the study of intensity changes of the OH bands and of the O_2 "atmospheric" band (8640 Å). A rather clear correlation has been found between the intensity of this last band and the one of the 5577 Å ray of (O_1). *Subject Heading:* **1. Night sky spectrum.**—*A.V.*

10.1–242 523.77:551.521.326

Guilino, G. and Maier-Leibnitz, H. (*Max Planck Institut für Physik der Stratosphäre, Munich*), **Une nouvelle méthode pour l'étude de la lumière du ciel nocturne.** [A new method for the study of the night airglow.] *Journal de Physique et le Radium*, Paris, 19(3):270–272, March **1958.** 5 figs., 4 refs. French and English summaries p. 270. **DLC**—A monochromator is described that produces modulated light by interferences of a spectral line, whereas a continuous background is not modulated. No correction is needed for the background and the apparatus is capable of registering faint and extended light sources. *Subject Headings:* **1. Spectrometer 2. Night airglow 3. Munich, Germany.**—*Authors' abstract.*

10.1–243 551.521.1:523.75

Rosseland, Svein and Tandberg-Hanssen, Einar, **On some solar disturbances on August 18 and September 24, 1956.** *Astrophysica Norvegica*, Oslo, 5(11):279–287, March **1957.** 9 figs. (incl. photos), 2 tables, 3 refs. **DWB**—The correlation between solar radio bursts and high-speed features on the sun has been studied in some detail in two cases observed at Harestua in 1956: (1) during the development of two dark surges on 18 Aug. and (2) during the activation of the limb prominence on 24 Sept. The motion of the prominence material has been analyzed relative to the position of the limiting iso-diaphanous surface for the frequency in question, i.e., 200 Mc/s. It is pointed out that the time correlation between the occurence of the radio bursts and the penetration of prominence material through the isodiaphanous surface is close enough to support the view that the excess radio noise is generated in the moving prominence material. *Subject Headings:* **1. Solar radio noise bursts 2. Solar prominences.**—*Authors' abstract.*

10.1–244 551.521.7:629.396.8:523.78

Tuominen, J.; Riihimaa, J. and Tuori, K., **Solar eclipse of June 30, 1954 as observed in Helsinki on wave-length 3.7 meters.** *Annales d'Astrophysique*, Paris, 18(3):147–150, May/June **1955.** 2 figs., 3 refs., 3 eqs. French and Russian summaries p. 147. **DWB, DLC**—Observations of radio waves from the sun were made in Helsinki on the frequency of 81.5 mc by means of a radio telescope (a phase switching interferometer). Observed values of percentage of radiation during the eclipse are graphically presented and compared with O'Brien's brightness distribution values based on interferometric techniques and the assumption of a circular symmetry of radiation. It is found that the solar disk is slightly brighter than found by O'Brien and that the corona is brighter at the equator than at the poles. Details of instrumentation and method are discussed. *Subject Headings:* **1. Solar radio radiation during eclipse 2. Solar eclipse, June 1954 3. Helsinki, Finland.**—*G.T.*

TEMPERATURE

See also: **Turbulent diffusion of momentum and heat** (Spengos, Cermak), 10.1–17; **U. S. W. B. climatological records** (Baliles), 10.1–66; **Frost damage to cranberries, Mass.** (Cross), 10.1–107; **Stratosphere temperature measurements** (Petit, Pepipta), 10.1–150; **Frost protection, Voivodina, Yugoslavia** (Otorepec), 10.1–172; **Phasal state of precipitation and glaze** (Volevakha, Muchnik), 10.1–178; **Meridional temperature profiles, No. Hemisphere** (Defant), 10.1–210; **Siberian high, Japan** (Yoshino), 10.1–222; **Influence of relief, Urville, France** (Bouchet), 10.1–324.

10.1–245 551.524.34:551.583.14(521.6)

*Kato, H.; Naito, W. and Mitsubayashi, T., **Changes of air temperature (Climate changes in Tokai District, Pt. 1).** *Journal of Meteorological Research*, Tokyo, 9(6):422–426, July **1957.** 3 figs., table, 5 refs. Also: **Comment** by T. Fujita and **Reply** by Kato. *Ibid.*, 10(1):79–81,

1956. fig., 2 tables. In Japanese. **DWB**—The authors investigated local climatic trends in Tokai District in order to obtain fundamental data for long-range forecast. Year to year changes of monthly mean temperature, monthly total precipitation, monthly total duration of sunshine and monthly mean wind speed are investigated by computing 7-yr moving averages. In this first report, investigations about changes of air temperature are started. By these investigations the next points are revealed. (1) The monthly mean air temperature at Takayama (36°09′N, 137°15′E: in northern Tokai), Nagoya (35°10′N, 136°58′E: in central Tokai), and Hamamatsu (34°43′N, 137°43′E: in southern Tokai) show rhythmic secular variation with 25∼30—and 50∼60—year period. (2) Secular variation of summer temperature in Tokai District shows upward trend after 1905. (3) Secular trend of annual mean temperature at Nagoya is about 1°C/100 years, and at Takayama there exists no such trend. At Hamamatsu the trend is smaller than at Nagoya. *Subject Headings:* **1. Climatic variations 2. Climatic trends 3. Monthly mean temperature data 4. Tokai District, Japan.**—*Authors' abstract.*

10.1–246 551.524.34:551.513.2

*Simojoki, Heikki, **On the frequency of the rhythms appearing in the annual course of temperature with regard to the atmospheric circulation.** *Geophysica*, Helsinki, 4(3):94–99, **1953.** 4 figs., 2 tables., 2 refs. **DWB**—Each year, on the average, about 19–21 cycles or "rhythms" show up in the 5-day mean temperature curve for 6 stations in latitudes varying from 52° (Potsdam) to 78° (Spitsbergen). Data for 1921–43 were analyzed, and extremes of 14–22 at Spitsbergen and 19–25 at Jan Mayen were found in various years. However, the uniformity of means is remarkable. The same treatment for the circulation index has shown the uniformity of that parameter and its correspondence with the temperature cycles. Data are presented in tables, graphs and histograms for comparative purposes. *Subject Headings:* **1. Temperature rhythms 2. Zonal index rhythms 3. Spitsbergen 4. Jan Mayen.**—*M.R.*

10.1–247 551.524.35

Fokina, E. A., **Tipy mesiachnykh otritsatel 'nykh temperaturnykh anomaliĭ v Tashkente.** [Type of monthly negative temperature anomalies at Tashkent.] (In: Akademiia Nauk Uzbekskoĭ SSR. Institut Matematiki i Mekhaniki, **Meteorologiia i gidrologiia v Uzbekistane.** Tashkent, **1955.** p. 179–186. 3 figs., 4 tables, 2 refs., eq.) **DLC**—Having calculated the mean and extreme positive and negative monthly temperature anomalies for the period 1876–1957, the author analyzes only the marked negative anomalies beginning with −2.0°C; the value of the extreme negative anomaly is −9.4°C. The temperature anomalies are divided into three groups on the basis of 2°C intervals: namely A-2.0 to 3.9°C; B-4° to 5.9°C and C-6.0° and above. These three groups, in turn, are comprised of five types of temperature regimes in the course of a month with negative anomalies. These types are characterized briefly as follows:

	Decade		
Type	First	Second	Third
I	warm	cold	cold
II	cold	warm	cold
III	cold	cold	warm
IV	unstable temperature regime		
V	temperature almost always below normal		

Detailed description of the temperature regime types, the frequency of the types during the year, the prevailing weather types over Central Asia associated with these types is given. An index for characterizing temperature anomalies is developed. *Subject Headings:* **1. Temperature anomalies 2. Temperature regime 3. Tashkent, U.S.S.R.**—*I.L.D.*

10.1–248 551.524.36:551.524.371

Arléry, R., **Contribution à l'appréciation du risque dans la lutte contre les gelées de printemps.** [Contribution to the risk appraisal in the action against spring-frosts.] *La Météorologie*, Paris, Ser. 4, No. 50:139–148, April/June **1958.** 5 figs., 4 refs. French, English

and Spanish summaries p. 139. **DWB**—Making use of the minimum temperatures registered from 1931 to 1955 by the "Institut Expérimental des Tabacs" at Bergerac, graphs are established for estimating: a) the probability of observing, at a given date, minimum temperatures lower than or equal to certain limits; b) the average number of days when, after a given date, temperature in the shade stands a chance of becoming lower than fixed points. These results are compared with those which can be established in the same way by means of observations made at Paris-Parc Saint-Maur over 75 yrs (1876–1950). By considering merely the number of years—during the 28 yrs 1930–1957—the last minimum temperature lower or equal to limits selected, took place at Bergerac, after a certain date. A graphic illustration is given of the diminution of the risk of frost at that station, from mid-March at the end of the month of May. *Subject Headings:* **1. Spring-frosts 2. Minimum temperature 3. Bergerac, France.**—*Author's abstract.*

10.1–249 551.586:685.53 551.524.36(7)

Dodd, Arthur V., **January temperatures in North America as a basis for sleeping bag issue.** *U. S. Quartermaster Research and Engineering Center. Environmental Protection Research Div., Research Study Report, RER-15,* April **1958.** 6 p. 8 figs., table. **DWB** (M86 U585re)—Charts of North America and Eurasia show isotherms of mean daily minimum temp. for Jan., frequencies of temperatures which occur 1%, 5% and 10% of the time in Jan. for N. America, lowest minimum temp. expected to occur on 3 successive days, three times during any cold season (also tabulated for 68 stations), sleeping bag authorizations in the U. S. and proposed clothing requirement areas for N. America. The applicability of the data for cold stress determinations, and hence, for sleeping bag and clothing requirements is discussed in text. Temperatures up to 60°F higher than outdoors may be found in snow shelters in Alaska, but occasionally the soldier must be exposed to ambient air temperatures. *Subject Headings:* **1. Minimum temperature frequencies 2. Sleeping bag temperatures 3. North America.**—*M.R.*

10.1–250 551.524.36(99)

McCormick, R. A. (*U. S. W. B., Wash., D. C.*), **An estimate of the minimum possible surface temperature at the South Pole.** *Monthly Weather Review,* Wash., D. C., 86(1):1–5, Jan. **1958.** 3 figs., 2 tables, 9 refs., 5 eqs. **DWB, DLC**—A model is presented of the radiation and consequent temp. regime over the South Pole from the beginning (March) to the end (Sept.) of the polar night. This model gives far too low a temp. at the snow surface (−200°C) 180 days after the original sounding. The computations were made in steps for 3, 10, 20, 30, 40, 50, 70, 90, 120, 150 and 180 days. Moisture was considered, especially in the inversion layer, and CO_2 which is very important where water vapor is very small. Heat conduction from the earth and advective heat gain during the polar night partially offset the radiative losses in the troposphere. In the ozonosphere there is no such compensating mechanism. Hence, the pure radiative model is more suitable to the stratosphere than for the troposphere. *Subject Headings:* **1. Minimum possible south pole temperature 2. Radiative balance over snow 3. South Pole.**—*M.R.*

10.1–251 551.524.36(98)

Thomas, M. K. and Titus, R. L. (*both, Climatological Div., Met. Branch, Canada*), **Abnormally mild temperatures in the Canadian Arctic during January 1958.** *Monthly Weather Review,* Wash., D. C., 86(1):19–22, Jan. **1958.** 2 figs., 2 tables, 4 refs. **DWB, DLC**—Temps. of 40°F at Arctic Bay, Canada, on Jan. 22 and 23, 1958, and 32°F at Alert on Jan. 24 are the only freezing or above freezing temps. ever recorded in the Canadian Arctic above 70°N in Jan., and are higher than any ever recorded between Nov. 1 and April 30. The month of Jan. was warmest on record at 5 Arctic Weather Stations (+16°F above normal on N. Ellsmere Island). Record high temps. occurred at Prince Rupert (64°F) and Dawson (47°F on Jan. 7) where the previous high was 36°F (60 yr record). Synoptic causes are discussed (e.g., the N.W. movement of a low over Davis Strait, allowing warm air to flood the Canadian Archipelago). *Subject Headings:* **1. Record warm winters 2. High temperatures, Canadian Arctic (Jan. 1958) 3. Canadian Arctic.**—*M.R.*

10.1–252 551.524.37(759) 551.577

*Johnson, Warren O., **Winter minimum temperatures in Peninsular Florida: summary of 20 seasons, 1937/38 through 1956/57.** Lakeland, Florida, Federal-State Frost Warning Service, April **1958.** 70 p. almost entirely tables. **DWB** (M24.37 F293W)—A series of short articles on: 1) The Frost Warning Service in Florida; 2) Cold weather in Florida, its nature and cause; 3) Description of weather each season since 1935–57, especially frost, excessive rains and hurricanes; historic freezes in Florida (since 1747, and tabulated by years for 20 places from 1894–1934), rainfall statistics on the Peninsula (44 stations), freezing temperature statistics for 120 stations (number of hours, cases, first and last dates, lowest temperature and date each season from 1937–8 to 1956–7) using temperatures of 32°, 30°, 28°, 26°, 24°, 22° and 18°; maps of cold and warm location isopleths of above data, graphs of probability of a season with $\leqslant 32°$, $\leqslant 30°$ and 28°, graphs of fall and spring 32° and 28° hazard, pattern of minimum temperature during some of the major freezes (1895–1958) and hurricane tracks over Florida. *See* 4C–354 for summary of 15 year period. *Subject Headings:* **1. Minimum temperatures in Florida 2. Freezing temperatures 3. Rainfall data 4. Hurricane tracks 5. Florida.**—*M.R.*

10.1–253 551.524.7:551.510.535

Johnson, Francis, S. (*Lockheed Aircraft Corp., Palo Alto, Calif.*), **Temperatures in the high atmosphere.** *Annales de Géophysique*, Paris, 14(1):94–108, Jan./March **1958.** 11 figs., 15 refs. French and English summaries p. 94. **DLC**—The temperature distribution of the high atmosphere is discussed on the assumption that the ionosphere is heated primarily by solar radiation and that the temperature distribution is controlled by thermal conduction. A model is presented which agrees well with the rocket observations and with most of the radio observations, and in which the thermal conduction is consistent with the absorption of solar energy. The amounts of solar energy are in agreement with the rocket observations in those spectral regions in which observations have been made. However, no observations have been made in the spectral region which is most important with regard to controlling the temperature of the F region of the ionosphere. The amount of solar energy which must be assumed to be present in this spectral region in order to give a thermally consistent model with temperatures as high as those required by rocket and radio observations is not unreasonable from an astrophysical viewpoint. *Subject Headings:* **1. Temperatures in the high atmosphere 2. F Region 3. Ionosphere.**—*Author's abstract.*

SOIL TEMPERATURE

See also: **Rice field temp., Japan** (Sato), 10.1–321; **Field microclimatology, Japan** (Sato), 10.1–322.

10.1–254 551.525.2

Johnson, O., **Some early springtime surface temperature measurements.** *Canada. Experimental Station, Ralston, Alberta, Suffield Technical Paper*, No. 67, April 30, **1955.** 5 p. 6 figs., 4 tables, 2 refs. **DWB** (M055 C212s)—During Feb. and early March of 1954, daytime temperature measurements were made on snow, wet soil, dry soil and grass surfaces. The results show that, in general, the surface temperature was higher than the air temperature during daylight hours. On the average, dry soil was warmest, followed by dry grass, wet soil, 4 ft air temperature and snow. The difference increased with decreasing wind speed, with increasing insolation and decreasing air temperatures. The differences between dry soil and grass were small. Differences between dry soil and air temperatures were sometimes great, the maximum observed being 28°F. *Subject Headings:* **1. Surface temperature measurements 2. Temperature measurement of various ground cover.**—*Author's abstract.*

10.1–255 551.525.5(471.1)

*Keränen, J., **On frost formation in soil.** *Fennia*, Helsinki, 73(1), **1951.** 14 p. figs., tables. **DLC** (G23.G4)—Relation between snow cover, frozen ground, ground water and soil moisture at Helsinki during Nov. 1940–May 1941 is shown graphically and analyzed on the basis of empirical equations derived from records made at Sodankylä, Finland in 1915–17 and at Pavlovsk, Russia in 1890–1901 (for various kinds of soil). *Subject Headings:* **1. Soil freezing data 2. Helsinki, Finland.**—*M.R.*

WATER TEMPERATURE

See also: **Ice temperatures in glaciers, U.S.S.R.** (Avsiuk), 10.1–85.

10.1–256 551.526:551.464(267)

Balarama Murty, C. (*Dept. of Geophysics, Andhra Univ.*), **Water-masses of the western central Bay of Bengal during November.** *Current Science,* Bangalore, 26(3):80, March **1957.** fig., table, ref. **DWB, DLC**—In west central Bay of Bengal, up to a maximum depth of 350 m, temperature and salinity observations were taken for November. The T-S plots for various stations and a table of certain depth ranges for different water masses are given by the author. *Subject Headings:* **1. Water temperatures 2. Vertical water temperatures 3. Salinity distribution 4. Bay of Bengal.**—*N.N.*

10.1–257 551.526:551.465 551.465:546.13

Moriyasu, Shigeo, **Seasonal variations of water temperature and chlorinity in the upper layer (On the fluctuation of the Kuroshio south of Honshu, Pt. 2).** *Kobe, Japan. Marine Observatory, Memoirs,* 12(2):1–18, March **1958.** 12 figs., 2 refs. **DWB**—Many useful studies have been made about the annual variation in the oceanographic elements of the Kuroshio in the considered sea area and the outline has been made clear. KOENUMA had a series of works regarding the Kuroshio, in which seasonal variation of water temperature was considered (1939). KOIZUMI (1955) treated oceanographic data of the ocean weather station "Tango" (29°N, 135°E) and discussed characteristics of the annual variation of chlorinity in their interesting way. We will study the seasonal variation of water temperature and chlorinity in the upper layer, mainly. Here, the dynamical consideration is not made but the diffusion equation is used to explain the variation. *Subject Headings:* **1. Seasonal water temperature variations 2. Seasonal chlorinity of water variations 3. Seasonal variations of Kuroshio Current 4. Kuroshio Current.**—*Author's abstract.*

10.1–258 551.526:551.464(261.3)

Wüst, Georg; Noodt, E. and Hagmeier, E., **Die Verteilung von Temperatur, Salzgehalt und Dichte.** [Distribution of temperature, salinity and density.] *Kieler Meeresforschungen,* Kiel, 13(2):163–185, **1957.** 12 figs., 4 tables, 9 refs. English summary p. 185. At head of t-p.: Ergebnisse eines hydrographisch-produktionsbiologischen Längsschnitts durch die Ostsee im Sommer 1956, Pt. 1. **DWB**—Serial observations supplemented by measurements with an electrical-resistance-thermometer and carried out on the R. V. "SÜDFALL" in July/August 1956 made it possible to construct more detailed longitudinal sections of temperature, salinity, and density through the Baltic, from Kiel Bay to the Gulf of Finland, following the trough of maximum depths. Some insight is gained into the complicated micro-stratification of this brackish sea, differing in some details from former sections. In different horizons, in Arcona Basin as well as in Bornholm Basin, up to 4–5 warm intrusions into the water below the thermocline are registered; quantities of warmer and saltier water from western origin cause a fourfold splitting of the discontinuity-layers of salinity and density within these basins. Single small intrusions of warm water are reported even from Gotland Basin. Consequences for further investigations are discussed. *Subject Headings:* **1. Water temperature distribution 2. Salinity distribution 3. Sea water density 4. Baltic Sea 5. Kiel Bay 6. Gulf of Finland.**—*Authors' abstract.*

10.1–259 551.526.6:551.465(267)

*Albrecht, Fritz H. W., **Untersuchungen über den Wärmeumsatz an der Meeresoberfläche und die Meeresströmungen im Indischen Ozean.** [Research on the heat exchange at the sea surface and the currents in the Indian Ocean.] *Geofisica Pura e Applicata,* Milan, Vol. 39:194–215, Jan./April **1958.** 4 figs., 3 tables, 21 refs., 6 eqs. German and English summaries p. 194–195. **DLC**—The Indian Ocean N of 35°S seems to be an isolated water mass (as to heat balance) but calculations shown in this article refute this assumption; actually the ocean loses heat, which is replaced by ocean currents in the equatorial zone during Northern Summer. Also the heat balance is not uniform throughout the ocean. A large region of heat loss exists in the Central Indian Ocean, east of Madagascar, and regions of heat gain lie to the N and S of this region, with compensating advection of heat by currents at the sea surface and in deep

layers. The text deals first with the theory; then with charting heat (radiation and cloud cover) balance; then with charts of heat exchange at the sea surface; then with the annual heat balance and sea surface temperature regime of the entire Indian Ocean; with the current system of the Indian Ocean; heat exchange and sea surface temperature in the drifting water masses; and, finally, with the net heat balance of the Indian Ocean. Monthly values obtained for 10 trajectories of drifting water masses, include heat exchange and temperature along the paths. These are also charted. A phase difference of 2 months was found between heat exchange and mean sea surface temperature, and it was found that the surface layer, influenced by the heat exchange, averages 125 m thick. Data from the Australian radiation network were used in calculations of energy received. *Subject Headings:* **1. Heat balance of Indian Ocean 2. Radiative exchange over Indian Ocean 3. Ocean currents 4. Indian Ocean.**—*M.K.*

PRESSURE AND WIND

PRESSURE

See: **Pressure pattern flying** (Corwin), 10.1–96; **Typhoon movement forecasting** (Hashimoto), 10.1–168.

WIND

See: **Wind data analysis, Maudheim** (Hisdale), 10.1–55; **Wind analysis and low lat. winds** (Scott), 10.1–124.

TURBULENCE AND GUSTINESS

See also: **Turbulent diffusion of momentum and heat** (Spengos, Cermak), 10.1–17; **Large scale diffusion** (Solot, Darling), 10.1–18; **Turbulence and vorticity energy** (MacCready), 10.1–143; **Molecular and atmospheric diffusion** (Mange), 10.1–193; **Vorticity and divergence calculations, Tallahassee** (Landers), 10.1–199; **Micrometeorological profiles** (Charnock), 10.1–319.

10.1–260 551.551

Agarwala, K. S. (*Met. Office, New Delhi*). **Gustiness of wind in relation to its speed and direction at Visakhapatnam.** *Indian Journal of Meteorology and Geophysics*, Delhi, 8(4):450–458. Oct. 1957. fig., 3 refs. DWB, DLC—Chart shows prevailing surface wind direction and speed each month at each hour, and isopleths of gustiness on a scale of 0.1 to 0.8 for Visakhapatnam, lat. 17°42′N, long. 83°20′E. In Jan.–Sept. the gustiness is high from 8 a.m. to 6 p.m., reaching a maximum (0.8) in April from 1–2 p.m.—during the hot season. Minimum gustiness (0.1) comes at night in Jan. and Feb. (dry season). In Jan.–Sept. the strong southerly winds are the most gusty (sea breeze). Least gusty winds are light easterly. *Subject Headings:* **1. Gustiness and wind velocity 2. Diurnal gustiness regime 3. Seasonal gustiness regime 4. Visakhapatnam, India.**—*M.R.*

10.1–261 551.551.2

Weiller, A., **Considérations sur les dérivées approchées avec une application à la mesure de la viscosité.** [Considerations on the approximate derivatives with application to viscosity measurement.] *Journal Scientifique de la Météorologie*, Paris, 10(37):23–40, Jan./March 1958. fig., 8 refs., numerous eqs. French, English and Spanish summaries p. 23. DWB—After having recalled the formulae giving the first and second approximate derivatives, corresponding to finite differences, the author, by simple geometric considerations, shows the maximum errors thus made in respect to instantaneous derivatives. In the second part, those results are applied to the study of viscosity variation at an altitude from 200 to 600 m. *Subject Heading:* **1. Viscosity measurement.**—*Author's abstract.*

10.1–262 551.551.5:551.576.11:629.13

Ackerman, Bernice (*Univ. of Chicago*). **Turbulence around tropical cumuli.** *Journal of Meteorology*, 15(1):69–74, Feb. 1958. 4 figs., 3 tables, 5 refs. DWB, DLC—The rapid

fluctuations in airspeed experienced by an airplane have been used to define the areal distribution of turbulence associated with a cumulus cloud. In the majority of clouds examined, the turbulence was not confined to the cloud but was distributed around it asymmetrically. This asymmetry appears to be related to cloud shear. A mechanism by which the observed cloud-turbulence pattern may form is described. *Subject Headings:* **1. Turbulence in clouds 2. Turbulence around cumuli 3. Airplane turbulence observations.**—*Author's abstract.*

WIND DISTRIBUTION

See also: **Wind direction measurement** (Hosfeld, Hynek), 10.1–343.

10.1–263 551.552

Cramer, H. E.; Gill, G. C. and Record, F. A., **Recording of the direction of the mean surface wind—Massachusetts Institute of Technology.** (In: Lettau, H. H. and Davidson, Ben (*eds.*), **Exploring the atmosphere's first mile.** N. Y., Pergamon Press, **1957.** Vol. 1:13–14. fig.) **DWB**—Observations of wind direction were made at heights of 2, 4, 8 and 16 m with standard airways-type vanes. The instrumentation, namely the MIT tower installation, is described. The basic circuit diagram of the standard wind direction is presented. The calibration and performance and the data evaluation are discussed. *Subject Headings:* **1. Wind direction 2. Surface winds 3. Wind measurement techniques 4. Cambridge, Mass.**—*I.L.D.*

10.1–264 551.552(493)

Godart, O., **Essai sur la statistique des vents près du sol.** [Statistics on winds near the ground.] *Belgium. Régie des Voies Aériennes. Service Météorologique, Bulletin Trimestriel,* June/Aug. **1957.** p. 1–10. 2 figs., 4 tables. French, English and Dutch summaries p. 1. **DWB**—The vector wind data being in polar coordinates, harmonic analysis is used for the calculation of two dimension-moments for the grouping corrections of data in angular sectors. The calms in the statistics are considered as winds of a too small force for the anemometer to give an indication. To avoid the difficult systematic corrections, the lower limit *Vo* is estimated in the hypothesis of the exactitude of the three first moments calculated from the data. In trying a theoretical frequency function, all the winds of speed below *Vo* have been cut off. A χ^2 test has been performed in the hypothesis of a normal distribution at two dimensions for the wind data of Melsbroek Airport. It failed and it seems more probable that the marginal distribution of the speed of winds in a given direction is a type III distribution of PEARSON. *Subject Headings:* **1. Surface winds 2. Harmonic analysis 3. Melsbroek Airport, Belgium.** —*Author's abstract.*

WIND VARIATIONS AND SPECIAL WINDS

See also: **Mountain valley winds, Kzyl-Cha Valley, U.S.S.R.** (Kasymova), 10.1–203; **Vertical transfer of momentum, Anegada, Virgin Is.** (Charnock), 10.1–204; **Orographic disturbances and foehn** (Isler), 10.1–277.

10.1–265 551.553.11

Vorontsov, P. A., **Brizy Tsimlianskogo Vodokhranilishcha.** [Breezes of the Tsimliansk water reservoir.] *Leningrad. Glavnaia Geofizicheskaia Observatoriia, Trudy,* No. 54(116):81–95, **1955.** 10 figs., 3 tables, 3 refs., eqs. **DLC**—A detailed analysis of the breezes of the Tsimliansk reservoir on the basis of extensive aerological data obtained during the period June 30–July 28, 1954 is presented. The study consists of the following: periods with breeze circulation, description of the synoptic conditions during the initial development of a breeze, the wind regime at the meteorological stations during the periods when breezes prevail, the characteristics of air currents from land and sea, the vertical structure of a breeze, and the causes destroying the breeze circulation. Numerical data giving the movement of pilot balloons and gradual ascent velocity over an island, the characteristics of the movement of balanced pilot balloons during a dust storm, etc. are presented, as well as numerous wind roses. *Subject Headings:* **1. Reservoir breezes 2. Breeze circulation 3. Tsimlyansk, U.S.S.R.**—*I.L.D.*

10.1–266 551.555.9:63

Tsuberbiller, E. A., **Agroklimaticheskaia kharakteristika sukhoveev na territorii orosheniia Kuĭbyshevskogo gidrouzla.** [Agroclimatological characteristics of dry winds in the irrigation region of the Kuibyshev Hydroelectric network.] *Leningrad. Tsentral'nyĭ Institut Prognozov, Trudy*, 29(56):60–69, **1953.** 10 figs., 6 tables. **DLC**—An attempt is made to establish the probability of injury to plants by sukhovei winds in various parts of the Kuibyshev region in the absence of irrigation. The intensity of the dry winds as indicated in the atmospheric moisture deficit, the effect on plants, their geographic characteristics, etc., are discussed. Graphs show annual variations of dry winds at different localities, maps give isolines of total number of dry winds for the period April–Oct., days with intense sukhovei winds for April–Oct., days with very intense sukhovei winds, etc. for the same period, and tables give intense sukhovei winds, etc. for the same period, and tables give the probability of different number of days with sukhovei for individual years in case of different mean number sukhovei, probability of different number of days and sukhovei with wind velocity of 10 m/sec and more per individual years with varying average number of sukhovei, etc. *Subject Headings:* **1. Sukhovei winds 2. Sukhovei wind effects on plants 3. Kuibyshev, U.S.S.R.**—*I.L.D.*

WIND EFFECTS

See also: **Wind effects on sea level on New England Coast** (Miller), 10.1–79; **Wind load on structures** (Lightfoot), 10.1–114; **Wind effects on fish spawning, North Sea** (Carruthers), 10.1–116; **Wind & design loads on structures, U. S.,** 10.1–117; **Sand whirls, the Sahara** (Lacaze), 10.1–221.

10.1–267 551.556.4:551.578.46

Hoinkes, H. (*Innsbruck*), **Über die Schneeumlagerung durch den Wind.** [Snow transport by wind.] *Sonnblick-Verein, Vienna, Jahresbericht*, Vol. 51/53, 1953–1955, pub. **1957.** p. 27–32. fig., table, 9 refs. **DLC**—The problem of the validity of measurements of precipitation totalizers at high altitudes above the tree line is discussed and the discrepancy between totalizer measurements and the measurements on discharge and ice balance of glaciers, etc. is indicated relevant to this problem in snow transport by wind which involves two fundamental processes, occurring either separately or simultaneously, with or after snowfall. These include snow transport by wind during actual snowfall, and snow sweeping chiefly after snowfall. The results of systematic studies carried out during the winter of 1953/1954 in the region of the Hintereisferner in the Ötztal Alps on the thickness of snow cover in the vicinity of totalizers are discussed. Data on the amount of water in the totalizer and in the snow cover (given in a table) indicates the extent to which snow deposited on glaciers results from snow transport by wind. *Subject Headings:* **1. Snow transport by wind 2. Precipitation totalizers 3. Ötztal Alps, Austria.**—*I.L.D.*

10.1–268 551.556.1:551.515.2:634.92

Spurr, Stephen H. (*School of Natural Resources, Univ. of Mich., Ann Arbor*), **Natural restocking of forests following the 1938 hurricane in Central New England.** *Ecology*, Durham, N. C., 37(3):443–451, July **1956.** 8 tables, 16 refs. **DWB, DLC**—Contains an account of the damage to forests by the New England Hurricane of Sept. 21, 1938 and of the salvage operation. *Subject Headings:* **1. Hurricane damage to forests 2. New England.**—*I.L.D.*

10.1–269 550.342:532.593 551.556.8:550.342

Gelci, R. and Cazaie, H., **L'agitation microsismique au Maroc: corrélation avec la houle et le vent.** [Microseismic agitation at Morocco: correlation with wave and wind.] *France. Comité Central d'Océanographie et d'Etude des Côtes, Bulletin d'Information*, 10(2):52–63, Feb. **1958.** 8 figs., 10 refs. **DWB, DLC**—Studies made at Casablanca from 1952–7 show that microseismic action at Casablanca is of local origin and is connected with waves and wind—the waves affecting the frequency and the wind the amplitude. Sea breezes or winds have greater effect than land winds. Winds are probably an indirect rather than a direct cause. Correlograms and other statistical presentations and records are included and discussed. *Subject Headings:* **1. Microseismic waves 2. Wind effects on microseisms 3. Casablanca, Morocco.**—*M.R.*

10.1–270 551.556.8:551.46

Deacon, E. L. (*Div. of Met. Physics, C.S.I.R.O., Aspendale, Victoria, Australia*), **The stress of light winds on the sea.** *American Meteorological Society, Bulletin,* 38(9):540–542, Nov. **1957.** fig., 12 refs. **DWB, DLC**—G. NEUMANN's estimate of wind stress on the sea surface (*see* 8.3–225, March 1957, *MAB*), namely to the 5–10 fold range of the drag coefficient values for light wind conditions is discussed. NEUMANN's estimates are shown to be inherently improbable, and a drag coefficient greater at low than at high wind speeds conflicts with MONTGOMERY's evidence on the behavior of the evaporation coefficient. Values of the drag coefficient for the open sea, deduced from wind profiles, are summarized and show a rising trend with wind speed. *Subject Headings:* **1. Wind stress on water 2. Drag coefficients.** —*I.L.D.*

UPPER AIR WINDS

See also: **Large scale diffusion** (Solot, Darling), 10.1–18; **Jet stream navigation** (Hawkes), 10.1–100; **Measurement of ionospheric winds, Domont Seine & Oise, France** (Lejay), 10.1–125; **Diabatic wind profiles** (Elliott), 10.1–192; **Jet stream analysis, Paris, France** (Barbé), 10.1–207; **Jet stream theory** (Dahler), 10.1–209; **Wind aloft relationships** (Newton), 10.1–212; **Sun scintillation, Nancay, Trappes, France** (Kazès, Steinberg), 10.1–344.

10.1–271 551.557:551.510.535:551.501.8

Delobeau, F., **La haute atmosphère: état actuel des recherches sur les vents ionosphériques.** [The upper atmosphere: the current state of research on ionospheric winds.] *La Météorologie,* Paris, Ser. 4, No. 47:379–392, July/Sept. **1957.** 15 figs., 16 refs., 15 eqs. French, English and Spanish summaries p. 379. **DWB**—The existence of local irregularities in the distribution of ionization in the upper atmosphere gives rise to ionospheric winds. The author then reviews the structure of the ionosphere including Chapman's hypothesis on the production of electrons as a function of height, the equations for the movement of electrons in the ionization layers, etc. The procedure, theory and equations underlying the various methods for measuring the speed of ionospheric winds are presented in detail; these methods are the method of MITRA which observes at three neighboring points the fluctuation of an ionospheric echo from a vertically directed radioelectric emission; the observation of meteor trails by radio-electric methods and MUNRO's method which involved the recording of the heights of reflection of a wave of fixed frequency in the F layer and in three very distant points. The method of three receivers has revealed the existence of variable winds in the E layer with a mean velocity of 80 met/sec (extremes of 20 and 300 met/sec); also the winds manifest a regular semidiurnal rotation. Comparable results have been obtained with the meteor method. In the F layer the regular semidiurnal rotation is not observed instead there is a 24-hour period. The amplitude of the velocities is of the order of 100 m/sec. *Subject Headings:* **1. Ionospheric winds 2. Ionospheric wind measurement techniques 3. Ionospheric radiowave reflection.** —*I.L.D.*

10.1–272 551.557:551.510.535

Jones, I. L. (*Cavendish Lab., Cambridge, Eng.*), **Theoretical views on drift measurements.** *Journal of Atmospheric and Terrestrial Physics, London, Special Supplement,* 1957 (Proceedings of the Polar Atmosphere Symposium, Oslo, 1956, Pt. 2), issued **1958.** p. 3–11. 9 figs., 6 refs., eq. **DLC**—Measurements of ionospheric drifts by observing the fading of a singly reflected wave at three closely spaced points on the ground are discussed. The magnitudes and directions of drift velocities observed from time delays between maxima and minima of the fading records are subject to large variations. These can be explained partly in terms of the variable orientation of a line of maximum amplitude and partly by changes in the amplitude pattern as it moves. The drift observed when the pattern on the ground is anisometric may be markedly different from the true drift, and tends to lie in a direction perpendicular to the direction of stretching. The effect on the average drift due to random orientation of the stretching and due to stretching in a preferred direction is discussed. When the amplitude variations at three stations are available, the auto-correlation and cross-correlation functions can be determined. From these, it is possible to determine the true magnitude and direction of the drift,

the size and shape of the amplitude pattern on the ground and also a quantity related to the random changes of the pattern. *Subject Heading:* **1. Ionospheric drift velocities.**—*Author's abstract.*

10.1–273 551.557:551.510.535

Jones, I. L. (*Cavendish Lab., Cambridge*), **The height variation of horizontal drift velocities in the E-region.** *Journal of Atmospheric and Terrestrial Physics, London, Special Supplement,* 1957 (Proceedings of the Polar Atmosphere Symposium, Oslo, 1956, Pt. 2), issued **1958.** p. 20–22. fig., 3 refs. **DLC**—Observations of ionospheric drift velocities have been made simultaneously on two neighboring frequencies. The frequencies used were 2 Mc/s and about 2.5 Mc/s, so that during the daytime, reflections were obtained from the E region. The heights of reflection on the two frequencies differed by about 5 km, thus information about the drift at heights separated by this amount could be obtained. During the winter months it was found that the phase of the semi-diurnal component of velocity, varied with height, the phase being advanced with height. The fact that the results from the neighbouring reflection heights are different, suggests that they are representative of the conditions near those heights. The phase change with height is consistent with the observations made on drifting meteor trails. *Subject Headings:* **1. Ionospheric drift velocities 2. E region 3. Ionospheric drift height variations.**—*Author's abstract.*

10.1–274 551.557:551.510.535

*Wiewall, Miguel, Jr., **Further observations of ionospheric drifts and related phenomena with spaced radio receivers.** Puerto Rico. Univ. College of Agricultural and Mechanic Arts, Mayaguez, Contract AF 19(122)-476, (Study of Ionospheric Winds), Scientific Report, No. 4, and Final Report, Jan. **1957.** 167 p. 43 figs., 80 tables, 14 refs. **DWB** (M57 P977s)—A voluminous compilation of tabular and graphic data on seasonal, diurnal and height variations in ionospheric drift directions and speeds for vertical incidence pulse echoes at 2.33 and 4.57 mc obtained at a Tripartite receiver network at Mayaguez, Puerto Rico during Feb. 1954—summer 1956, incl. Equipment is described and illustrated, computation techniques outlined and turbulence conditions analyzed. The method of "similar fades" has been replaced by the 6-point correlation method of YERG (1955). *Subject Headings:* **1. Ionospheric wind data 2. Ionospheric drifts 3. Mayaguez, Puerto Rico.**—*M.R.*

10.1–275 551.557.5:551.515.8

Bessemoulin, Jean and Viaut, André, **Courant-jets et front polaire.** [Jet-streams and polar front.] *Académie des Sciences, Paris, Comptes Rendus,* 246(14):2154–2156, April 9, **1958.** 2 figs. **DLC**—The authors work out the vertical wind gradient according to the equations of the air motion. They obtain a formula which connects the vertical wind gradient $\partial V/\partial_p$ with the isobaric temperature gradient $\overrightarrow{D_p T}$. This formula demonstrates that the greater the isobaric temperature gradient, the more the wind in altitude increases. The wind maximum is reached at the level at which the isobaric temperature gradient reduces to zero. The center-line of the jet stream is situated at the level at which the tropical troposphere temperature is equal to the polar stratosphere temperature. A correlation exists between the polar fronts and the jet streams; it explains that the "jet stream" corresponds with the maximum precipitations (rain or snow). Jet stream appears rather as an element of the disturbances than as an element of the general atmospheric circulation, so far of course as this remark is also applicable to the polar front. *Subject Headings:* **1. Jet stream 2. Polar front.**—*A.V.*

VERTICAL MOTION

See also: **History of U. S. W. B. climatological records** (Hagarty), 10.1–68; **Mechanics and thermodynamics of the atmos.** (Wurtele), 10.1–196.

10.1–276 551.558.1

Woodward, B., **A theory of thermal soaring.** *Schweizer Aero-revue,* Berne, 33(6):321–324, June **1958.** 6 figs., 2 refs. **DLC**—In order to discover the field of motion in and around a

thermal, experiments on isolated thermals have been conducted at the Dept. of Meteorology, Imperial College, London. The author describes the laboratory techniques and results that are of special interest to the glider pilot. The thermals described are: 1) rising through neutral surroundings; 2) no longer attached to the ground. The thermals are "isolated thermals." a) This means that they are rising in air which is neither stable nor unstable, the condition that generally exists on days of good convection below cloud base and above the super-adiabatic layer close to the ground. The same type of motion would be encountered inside cloud (if surrounding air is neutral, i.e., temperatures follow the wet adiabatic). b) The thermals in the laboratory were created with a uniform density. Immediately after release they were no longer attached to their source. The manner of release is perhaps the primary difference from the atmosphere, where it is not properly understood and is extremely variable. It is felt that a thermal leaving the ground is generally in the form of a "column," i.e., after a short time its vertical dimensions are greater than its horizontal. *Subject Headings:* **1. Thermals 2. Convection 3. Gliding.**—*Author's abstract.*

10.1–277 551.558.21:551.555.3

§Isler, R., **Was wissen wir vom Föhn?** [What do we know about föhn?] *Schweizer Aero-Revue*, Berne, 33(1):11–13, **1958.** 3 figs. **DLC**—Some characteristics of föhn, interesting for air-navigation: horizontal axled vorticities, turbulence. The note is illustrated by a synoptic weather chart, numerous schematic drawings and some photographs of lenticular clouds. *Subject Headings:* **1. Orographic disturbances 2. Föhn winds 3. The Alps.**—*A.V.*

10.1–278 551.558.29

Gubin, V. I., **O sdvige vetra s vysotoĭ.** [Shift of wind with height.] (In: Akademiia Nauk Uzbekskoĭ SSR. Institut Matematiki i Mekhaniki, **Meteorologiia i gidrologiia v Uzbekistane.** Tashkent, **1955.** p. 111–120. 3 refs., 28 eqs.) **DLC**—The author develops a new method for determining the shift of the actual wind height so as to determine more exactly the horizontal temperature field. Proceeding from the equations of atmospheric motion and reflecting friction, the author derives the fundamental equation for the shift of wind with height, namely:

$$\frac{dv_{i,z}}{dt} 2\omega_{ik} V_{kz} = \nabla_{[z} P \nabla_{i]} \alpha,$$

where

$$\nabla_z, \nabla_i = \frac{\partial}{\partial z}, \frac{\partial}{\partial x}, \frac{\partial}{\partial}; \quad v_{i,z} = \frac{\partial v'}{\partial z}.$$

On the assumption that the movement is horizontal and the atmosphere is quasistationary, the solution of this equation of wind motion is:

$$v_{i,z} = -\frac{1}{(\omega_{ik})^2}\left[\nabla_{[z} P \Delta_{k]} \alpha \omega_{ki} - \frac{1}{2}\frac{d}{dt}\left(\nabla_{(z} P V_{i]} \alpha\right)\right].$$

Physically, this equation corresponds to the assumption that the variation of wind with height is uniform along a trajectory of movement of unit mass. The above equations are transformed from the z-system with independent variables x, y, z, t to a p-system (x,y,p,t) with pressure in the form of one of the independent variables, namely;

$$\frac{\nabla_i T}{T} = 2\omega_{ik}\frac{\partial v_k}{\partial \phi} - \frac{\partial}{\partial T}\frac{\partial v_i}{\partial \phi}$$

$$\frac{\partial v_i}{\partial \phi} = \frac{1}{(\omega_{ik})^2}\left(\frac{\nabla_k T \omega_{ki}}{T} - \frac{1}{2}\frac{\partial}{\partial t}\frac{\nabla_i T}{T}\right).$$

The determination of the temperature field, with the aid of these equations and devised equations involving the calculation of wind shift from the thermal wind, is developed with the aid of devised equations. *Subject Headings:* **1. Wind shift with height 2. Temperature field calculations 3. Wind variations.**—*I.L.D.*

AQUEOUS VAPOR, HYDROMETEORS AND HYDROMETEOROLOGY

HUMIDITY

See also: **Moisture damage to cargoes** (Canfield), 10.1–113.

10.1–279 551.571:633.11

Hoffmann, K., **Untersuchungen zur Frage des Kornfeuchteverlaufes bei Winterweizen.** [Investigations on the question of the grain-moisture changes in winter wheat.] *Angewandte Meteorologie*, 3(2):44–46, **1957.** 4 figs., table, 3 refs. **DLC**—Studies on the grain moisture content of winter wheat were carried out in the summer of 1956 at the Etzdorf Experimental Farm of the Martin Luther University, Halle, in order to test the validity of the Rentschler and Voigy nomograms for grain moisture content. The moisture content of samples taken every two hours between 0600 and 2000h and also at 2400h was determined. The moisture content was determined simultaneously for grains, entire ears, stalks and straw at heights of about 10 and 50 cm. The measured grain moisture content and that determined from the nomogram did not differ by 1% for individual days between 0800 and 1700h when no precipitation occurred. It is shown that the moisture content of entire ears and stems closely corresponds to that of grains between 0800–1000h and 1700–1800h, so that grain moisture content can be determined from that of the moisture content of entire ears. The temperature and moisture conditions within the stand during the noon and evening hours and their relationship to the moisture content of the ears and stem are discussed. *Subject Headings:* **1. Moisture content of grain 2. Wheat 3. Halle, Germany.**—*I.L.D.*

CONDENSATION

See also: **Particulate clouds** (Green, Lane), 10.1–9; **Turbulence and vorticity energy** (MacCready), 10.1–143; **Silver iodide decay** (Smith et al.), 10.1–183; **Bénard flow in aerosols** (Tippelskirch), 10.1–195; **Soil humidity** (Damagnez), 10.1–305.

10.1–280 551.574.1:551.511.13

†Defay, R., **Sur la formation des germes de condensation dans la vapeur d'un corps pur.** [Formation of condensation nuclei in pure fluids.] *Journal Scientifique de la Météorologie*, Paris, 9(34):39–60, April/June **1957.** 4 figs., 2 tables, 19 refs., 83 eqs. **DWB**—In a new synthesis, this work resumes the nucleation theory of pure fluids. The conducting idea of this report is to distinguish the thermodynamics of the drop-phases, where individuality of the drop is followed in time, and that of "drop-particles" treated as association complexes. The latter are labile particles which form only stable populations. The condensation nucleus is the meeting point of those two descriptions. That manner of presentation leads to a very precise demonstration of the main formulae of the theory of embryos and nuclei and leads to a particularly simple calculation of nucleation speed. The author successively examines the "drop-phase," the definition of the nucleus, the free-energy of formation of a "drop-phase," the properties of "drop-particles," the equilibrium distribution of embryons, the apparition of nuclei, the nucleation and the crystalline nuclei of vapor. *Subject Headings:* **1. Thermodynamics 2. Nucleation.**—*A.V.*

10.1–281 551.574.1

Dessens, Henri; Serpolay, Roger and Soulage, Guy, **Chutes de neige provoquées à retardement par ensemencement en iodure d'argent.** [Snow falls induced by delayed effect of silver iodide seeding.] *Académie des Sciences, Paris, Comptes Rendus*, 246(2):292–295, Jan. 13, **1958.** 2 figs., 5 refs. **DLC**—Favorable meteorological conditions have limited the diffusion of silver iodide particles, and also the persistence of their ice-forming efficacy after 14 hrs in the atmosphere. In certain conditions, confirmation is obtained that the efficacy of silver iodide seeding can be manifested through the release of precipitation at a distance of several hundred

km from the seeding spot. *Subject Headings:* **1. Condensation physics 2. Silver iodide seeding 3. Les Landes, France.**—*A.V.*

10.1–282 551.574.1

*Roulleau, Maud, **Mécanisme de la congélation de l'eau.** [Water freezing mechanism, Pt. 1.] *Journal Scientifique de la Météorologie*, Paris, 9(36):127–146, Oct./Dec. **1957.** 7 figs., 6 tables, 18 refs. French, English and Spanish summaries p. 127. Also his **Mécanisme de la congélation de l'eau.** [Water freezing, Pt. 2.] *Ibid.*, 10(37):12–22, Jan./March **1958.** 2 figs., tables, 10 refs., eqs. French, English and Spanish summaries p. 12. **DWB**—At temperatures higher than −33°C, freezing is always set up by nuclei. The activity temperature of a nucleus depends on its crystalline structure (system of crystallization and dimension of lattice) and its size. The nuclei which come into contact in a natural condition in the atmosphere have ten or so privileged activity temperatures, extending from −4° to −33°; they are all the more numerous as they act at lower temperatures. Influence of size is such that, for a same type (AgI), the activity temperature varies from −3° (for 1 mm) to −15° (for 25 mμ). Another very important property of nuclei is to lose their activity during successive freezings. For instance, a nucleus of silver iodide, active at −13°, no longer causes solidification of water, except at −16° after 5 freezings, and at −19° after 10 freezings. The majority of nuclei behave in the same manner; a small number, however, the chemical nature of which does not show them as different in any way from the others, retain the same activity temperature, even after 10 freezings. In Pt. 2, Spontaneous congealing of undercooled water takes place at temperatures lower than −33°C. By applying the VOLMER and FRENKEL theory and the relation established by TURNBULL and FISHER, it is possible to calculate the critical dimensions of the crystal nucleus starting, from which the solid phase can develop, and the rate which the crystal-nucleus is formed. Application of the experimental results enables the interfacial ice-undercooled water tension to be estimated; from it can be deduced the average life of drops at different temperatures, according to their dimensions. *Subject Headings:* **1. Nucleus physics 2. Freezing of supercooled water 3. Average life of drops 4. Magny-les-Hameaux 5. Water freezing 6. Activity temperature of a nucleus.**—*Author's abstract.*

10.1–283 551.574.1:551.578.4

Serpolay, R., **Sur la production et la nature d'une catégorie d'aérosols glaçogènes artificiels.** [Generation and nature of a category of artificial ice-forming aerosols.] *Académie des Sciences, Paris, Comptes Rendus*, 245(19):1646–1648, Nov. 4, **1957.** 3 refs. **DLC**—Different research on the nature of ice-forming aerosols, produced through volatilization of metals, led to the chemical preparation of material endowed with ice-forming properties when they are introduced into a fog with temperature between −5 and −18°C. These matters belong to the category of metallic oxides used for heterogeneous catalysis. We can mention particularly: Ag_2O, Al_2O_3, Cr_2O_3, CuO, Fe_2O_3, MgO, NiO, ThO_2 and ZnO. These results may indicate a new orientation in the research on aerosols, at least as active aerosols produced from silver iodide. *Subject Heading:* **1. Artificial ice-forming aerosols.**—*A.V.*

10.1–284 551.574.1:551.510.42

Soulage, Guy, **Sur une origine côtière de certains noyaux glaçogènes naturels.** [Coastal origin of certain natural ice-forming nuclei.] *Académie des Sciences, Paris, Comptes Rendus*, 246(1):143–145, Jan. 6, **1958.** 1 fig., 2 refs. **DLC**—The observation of high ice-forming powers of the air on the Atlantic coast suggests that certain natural ice-forming nuclei are formed along the coasts through the encountering of continental particles and marine particles. The coastal nuclei may be modified particles of the continental aerosol, and consequently stirred up as ice-forming particles through a short stay over the ocean, or only through the encounter of spray along the coast. Apart from that, the iodine present in the regions bordering the oceans permits the formation of iodides, certain of which are endowed with ice-forming power. *Subject Headings:* **1. Natural ice-forming nuclei 2. Sea salt nuclei 3. Sea spray.** —*A.V.*

10.1–285 551.574.1:551.509.67

Toye, M. J. (*Obs. du Puy de Dôme*), **Dessiccation de gouttelettes d'une solution de chlorure de sodium.** [Drying of droplets of a sodium chloride solution.] *Puy de Dôme. Observatoire, Bulletin*, Ser. 2, No. 3:71–77, July/Sept. **1956.** 4 figs., 5 refs. **DWB**—The smaller the diameter of a droplet of pure saline solution (NaCl) placed in an atmosphere with decreasing relative humidity, the more difficult becomes the crystallization of the salt in supersaturation. Thus at <50% relative humidity, the only drops remaining in solution are the very small ones. These were visible with a 40 power microscope but did not appear in the photographic experiments (with lower resolution) since no drop size—relative humidity relationship could be found except in the critical low limits. An introduction of pollution crystals of AgCl tended to cause crystallization by epitaxis at a higher relative humidity. This may explain the quicker crystallization of the larger droplets (which are more likely to be struck by a small polluting crystal than are the small droplets). *Subject Headings:* **1. Humidity-crystallization relationships 2. Desiccation of sodium chloride droplets 3. Epitaxis 4. Crystallization point of sodium chloride solutions 5. Silver iodide nucleation 6. Silver chloride nucleation.**—*M.R.*

CLOUDS

See also: **Radar echoes from cumulus clouds, Tucson** (Braham), 10.1–130; **Cirrus cloud forecasting** (Alt), 10.1–167; **Cumulonimbus formation, Arizona** (Reynolds), 10.1–177; **Global radiation, Genoa** (Bossolasco, Castagnoli), 10.1–226; **Turbulence around cumuli** (Ackerman), 10.1–262; **Temperature-rainfall relationships** (Bossolasco), 10.1–290; **Hail prevention experiments, France** (Soulage), 10.1–303.

10.1–286 551.576.1:629.135.2

Poppoff, I. G.; Robbins, R. C. and Goettelman, R. C. (*all, Stanford Res. Inst.*), **Nuclei in the exhaust of a jet engine.** *American Meteorological Society, Bulletin*, 39(3):144–148, March **1958.** 10 figs., 11 refs. **DWB, DLC**—Surveys were made of condensation nuclei, freezing nuclei, and water vapor concentrations in the exhaust wake of an F80 jet aircraft. Condensation nuclei concentrations were found to be maximum in a region of 50 to 75 ft aft of the tailpipe, with secondary maxima appearing at approximately 150 ft. No freezing nuclei were found, although observations indicated the possibility that they were present but inhibited by exhaust constituents. *Subject Headings:* **1. Jet aircraft contrails 2. Condensation nuclei.**—*Authors' abstract.*

10.1–287 551.576.11:551.509.616

Serpolay, R., **Enseignements tirés de deux groupes d'expériences sur des stratus surfondus.** [Results of two groups of experiments on supercooled stratus.] *Puy de Dôme. Observatoire, Bulletin*, Ser. 2, No. 4:115–120, Oct./Dec. **1957.** 2 figs., 2 refs. English summary p. 115. **DWB**—An experiment carried out with silver iodide smoke on a supercooled stratus cloud has pointed out that silver iodide particles can be suspended in the atmosphere for 18 hrs without their ice-forming ability being lost. The results of experiments carried out on two different supercooled stratus clouds, jointly with silver iodide smoke and pulverization of liquid propane, have allowed us to differentiate the proper turbulence of each cloud. *Subject Headings:* **1. Supercooled stratus cloud 2. Cloud seeding.**—*Author's abstract.*

10.1–288 551.576.36:551.557.5

McLean, George S. (*G. R. D., A. F. Cambridge Research Center*), **Cloud distributions in the vicinity of jet streams.** *American Meteorological Society, Bulletin*, 38(10):579–583, Dec. **1957.** 10 figs., table, 5 refs. **DWB, DLC**—Cloud observations made by crew members during flights of Project Jet Stream are used to determine the frequency of occurrence of various types of clouds in the vicinity of jet streams. These cloud distributions may be useful in upper-air analysis and forecasting. Furthermore, a knowledge of cloud distributions may be used as an in-flight aid for identifying and locating jet streams. *Subject Headings:* **1. Cloud frequencies 2. Jet stream location 3. Project Jet Stream 4. Cloud observation from airplanes.**—*Author's abstract.*

PRECIPITATION

See also: **Precip. variability, Arizona** (McDonald), 10.1–20; **Rainfall duration frequencies, Bermuda** (Macky), 10.1–21; **Ice shelves, Maud Land, Antarctica** (Swithinbank), 10.1–54; **U. S. W. B. excessive precipitation records** (Hagarty), 10.1–67; **Monthly precipitation, Algeria** (Mayençon), 10.1–139; **Precip. echoes** (Lhermitte), 10.1–160; **Radar with fixed vertical beam, Magny-les-Hameaux, France** (Lhermitte), 10.1–161; **Thunderstorm rainfall, Kanto District, Japan** (Otsuka), 10.1–175; **Hurricanes Edna and Ione** (Kessler), 10.1–218; **Tropical air masses, Uzbekistan** (Nazarova), 10.1–223.

10.1–289 551.577.21:663.2:661.731

Ferenczi, S., **Die Rolle der Niederschlagsmenge in der Gestaltung des titrierbaren Säuregehaltes der Weine.** [Effect of precipitation amount on the titratable acidity of wines.] *Acta Agronomica*, Budapest, 7(1/2):65–95, **1957.** 21 tables, 18 refs. German, Russian and English summaries p. 92–95. **DLC**—A detailed comparison is made of acid content in 2066 wine samples of the years 1947–53 and precipitation amounts in Hungary. A positive correlation is found to exist (significant on the 5% level) between precipitation amount during the growing period and acidity of wines. The correlation appears in each of the four wine growing areas investigated and for all varieties of wine sampled. Rainfall in May and June is found to be the most significant from the point of view of this correlation. *Subject Headings:* **1. Precipitation-wine acidity relationships 2. Precipitation amounts 3. Wine acidity 4. Hungary.** —*G.T.*

10.1–290 551.577.1:551.576.36

Bossolasco, Mario, **Sulla genesi dalla pioggia.** [Formation of rainfall.] *Geofisica e Meteorologia*, Genoa, 5(1/2):1–2, Jan./April **1957.** 2 figs., 2 refs. **DWB**—On the basis of a statistical examination of cloud and accompanying air temperature data during March–Nov. over the period 1932–1954 obtained at Alpine observatories (Rigi, Sonnblick, Zugspitze and Santis), the author shows that the maximum frequency of clouds occurs when the air temperature is closest to 0°C for negative temperature but that distinct decrease in cloud frequency occurs for the immediately higher temperatures. The air temperature above 0°C at which the decrease occurs is termed the critical temperature and it is defined as the temperature (always positive) during which cloudiness decreases either through dissipation or precipitation. The critical temperature can be expressed by the formula $0(h) = 18.0°C - 0.0054\ h$ where h is height above sea level. An example of the frequency of cases of rainfall (drizzle), with clouds as a function of corresponding atmospheric temperature, indicates that the reduction of cloudiness can be attributed to the better "precipitability" of constituent elements of the clouds in a given field of air temperature. *Subject Headings:* **1. Rain-formation 2. Cloud frequencies 3. Temperature-rainfall relationships 4. Alps.**—*I.L.D.*

10.1–291 551.577.11:532.5

Arabadzhi, V. I., **Kinetika stolknoveniia kapel'.** [Kinetics of drop collisions.] *Meteorologiia i Gidrologiia*, No. 4:35–36, April **1956.** 3 figs. **DWB, DLC**—The author describes a method for studying droplet collision by means of motion pictures and reproduces some of the frames. It was found that colliding drops form ringlike water belts which gradually disintegrate. When droplets impinge upon a plane water surface the latter breaks up and simultaneously heads downward; subsequently, water is ejected upward (forming sometimes a symmetrical bubble), as a result of a momentary dampened oscillation of the water surface by the flow of the falling drops. *Subject Headings:* **1. Hydrodynamics 2. Kinetics of drop collisions.**—*I.L.D.*

10.1–292 551.577.13

Rougerie, Gabriel, **Acidité des eaux en milieu forestier intertropical.** [Water acidities in intertropical forest regions.] *Académie des Sciences, Paris, Comptes Rendus*, 246(3):447–449, Jan. 20, **1958. DLC**—The assumed acidity of intertropical waters is attributed, on the one hand, to the high atmosphere electrization which enriches the rain water in nitric acid, and on the other hand to the organic acids, owing to abundant vegetal materials, which are supposed to act on the water of the soil. A series of pH measurements, made in the forest

regions of the Ivory Coast, establishes that water taken at different moments of its cycle does not, in fact, present an acidity sensibly more remarkable than those of extra-tropical settings. *Subject Headings:* **1. Chemical composition of precipitation 2. pH content of rainwater 3. Forest effects on precipitation composition.**—*A.V.*

10.1–293 551.577.2:551.577.36

Levert, C. (*Met. Inst., Netherlands*), **Relation between point and areal rainfall.** *American Meteorological Society, Bulletin*, 38(10):618–620, Dec. **1957.** fig., foot-ref., eqs. **DWB, DLC**—It is shown that rainfall frequencies in a close network of stations [such as analyzed by F. A. Huff, *BAMS*, May **1956** (*see* 8.9–261, Sept. 1957, *MAB*)] give misleading correlation coefficients (i.e., $r=0.98$) if the y-values as well as the x-values are ranked. The same data which gives $r=0.83$, if only the x-values are ranked, give $r=0.98$, if both the x- and y-values are ranked. Thus the process of ranking has a linearizing effect that is false and should be avoided. Tests of significance should also be used with care, especially if 2 samples are drawn from the same population. *Subject Headings:* **1. Point-areal rainfall frequencies 2. Rainfall frequency distribution.**—*M.R.*

10.1–294 551.577.36

Visser, W. C. (*Afdeling Onderzoek van de Cultuurtechnische Dienst, Utrecht*), **Een nomogram voor de kansverdeling van de regenval.** [A nomogram for the random distribution of precipitation.] (In: Nederlandse Centrale Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek. Commissie voor Hydrologisch Onderzoek, **Verslagen technische bijeenkomsten 7–10 en Verslag inzake het verdampingsonderzoek in de Rottegatspolder 1947–1952.** pub. 's-Gravenhage, **1955.** p. 50–67. 8 figs., table, eqs. English summary p. 262–263; French summary p. 284–285.) **DWB**—A description of the construction of a nomogram by means of which it is possible to determine the relationship between the amount of rainfall and the probability of this amount being exceeded during a given season and for a given duration of rainfall. The general principle of constructing such a nomogram involves constructing frequency curves of rainfall for different months and for different periods which are plotted on logarithmic paper and made to coincide by transformation. The theory of the nomogram and its use are discussed. *Subject Headings:* **1. Rainfall probabilities 2. Nomograms.**—*I.L.D.*

10.1–295 551.575.37:551.579.1

§Caroff, J. and Sinthe, G., **Les crues de novembre 1957 en Algérie.** [The floods of Nov. 1957 in Algeria.] *La Météorologie*, Paris, Ser. 4, No. 50:123–134, April/June **1958.** 14 figs. French, English and Spanish summaries p. 123. **DWB**—At the end of Nov. 1957, immense flooding which lay waste the neighborhoods of Algiers and Constantine, caused important material damage to the territory. After giving a history of the floods, the authors submit a summary of the meteorological conditions which led to abnormal rains. Finally, a test of a method using ten-years of precipitation data is reported. *Subject Headings:* **1. Floods 2. Abnormal rains 3. Algeria.**—*Authors' abstract.*

10.1–296 551.577.37:551.579.1/2

Fontaine, P., **Les crues dans le Nord-Est de la France (Le Bassin de l'Ill).** [The floods in northeastern France in the Ill Basin.] *La Météorogie*, Paris, Ser. 4, No. 49:15–33, Jan./March **1958.** 13 figs. French, English and Spanish summaries p. 15. **DWB**—By studying meteorological situations responsible for the Ill Basin flooding from 1947 to 1956, light has been thrown on four types of flood periods for northeast France. While two of those types generally produce only very minor floods, the others, deriving from rapid alternation of hot and cold atmospheric currents or of their lasting conflict, often lead to important floods. Influence of snow (retention, then melting) produces aggravation of floods and, above all, makes them more sudden. When corrected from the effects of retention and of melting snow, the curve of ten-years of precipitation for northeast France, shows the magnitude and date of passage of a flood wave in the Ill Basin, at Gerstheim Bridge. *Subject Headings:* **1. Floods 2. Snow melting and retention 3. Ill Basin, Northeastern France.**—*Author's abstract.*

10.1–297 551.577.37/61

§Jalu, R., **Les précipitations anormales en fin décembre sur le centre et le Sud-Est de la France.** [The abnormal rainfall at the end of December in central and S.E. France.] *La Météorologie*, Paris, Ser. 4, No. 49:69–73, Jan./March **1958.** 3 figs. **DWB**—During the night from Dec. 24 to 25 and during the day of Dec. 25, 1957, an active perturbation gave an abundant rain- and snow-fall over the Massif Central and the Mediterranean coasts. The note gives an analysis of the meteorological situation that provoked this bad weather and disturbed considerably or interrupted completely road and rail traffic, and damaged installations and materials. *Subject Headings:* **1. Abnormal precipitation 2. Precipitation damage 3. Massif Central, France.**—*A.V.*

10.1–298 551.577.38

Decker, Wayne L. (*Missouri Univ., Columbia*), **The likelihood of extended dry periods in northeast Missouri.** *American Meteorological Society, Bulletin*, 38(10):615–617, Dec. **1957.** 3 figs., 3 refs., eq. **DWB, DLC**—A dry period is defined as the number of consecutive days with <0.20″ precip. Records for 3 stations in northeast Missouri for May through Aug. 1918–1947 are analyzed and the data presented in the form of frequency histograms and curves. There is a sharp decrease in number of dry periods between May and June (50% reduction) in 14-day dry periods. Then the expectancy rises in late June and July and decreases in early Aug., followed by a marked increase in late Aug. These data are useful for agricultural planning (selection of crops, varieties of crops and planting dates). *Subject Headings:* **1. Dry period frequencies 2. Drought frequencies 3. Northeast Missouri.**—*M.R.*

10.1–299 551.577.38:551.579.5

Hallaire, Marc and Hénin, Stéphane, **Dessèchement du sol et évolution des profils hydriques.** [Drying of soil and evolution of soil moisture profiles.] *Académie des Sciences, Paris, Comptes Rendus*, 246(14):2151–2153, April 9, **1958. DLC**—The soil moisture profile, while remaining under the dependence of a diffusion phenomenon, is entirely determined by the structure of the environment and particularly by the continuity of the water film. The study of the evolution of water in a nonsaturated environment must be carried out, taking into account not only the soil structure, but also the initial humidity on which the water supply continuity depends. The drying of a drier layer through a more humid layer would, consequently, be consistent with a certain logic of the drying phenomenon; it expresses merely the continuity of the films of the upper humid layer with the lower drier layer. *Subject Headings:* **1. Soil drying 2. Soil moisture profiles.**—*A.V.*

RAIN, SNOW AND HAIL

See also: **Hail frequencies, U.S.S.R.** (Pastukh, Sokhrina), 10.1–19; **Hail damage to aircraft, Beachy Head, Eng.** (Pavely et al.), 10.1–95; **Water content of snow** (Furukawa, Kuroda), 10.1–122; **Snowfall extremes, Vancouver** (Jackson), 10.1–174; **Ice nucleation** (Fukuta), 10.1–182; **Snow transport by wind, Ötztal Alps** (Hoinkes), 10.1–267; **Artificial ice-forming aerosols** (Serpolay), 10.1–283.

10.1–300 551.577.13:546.41:546.22

*Mukherjee, A. K. (*Met. Off., Jodhpur*), **Calcium and sulphur in rain water at coastal region.** *Indian Journal of Meteorology and Geophysics*, Delhi, 8(3):346, July **1957.** table, 2 refs. **DWB, DLC**—Miyake's (1948) suggestion that sea salts may be separated out of the atmosphere at a differential rate during precipitation, due to variations in solubility or hygroscopicity of some sulphates (e.g., $CaSO_4$) when compared with others (e.g., Na_2SO_4, $CaCl_2$ and $MgSO_4$) is tested. The calcium-sulphur ratios of Miyake and of Eriksson (1952) agree very well with theory based on solubility of these salts. *Subject Headings:* **1. Calcium-sulphur ratio in rainwater 2. Sea salt solubility in rainwater. I. Miyake, Y. II. Eriksson, E.**—*M.R.*

10.1–301 551.578.4:621.3:048

Visser, S. W., **De sneeuw op het dak.** [Snow on the roof.] *Hemel en Dampkring*, The Hague, 53(10):192–193, Oct. **1955. DLC, DWB**—Various comments on the author's article

Snow on the roof (*see* 8.6–259, June 1957, *MAB*) are summarized. This phenomenon is compared by some to the formation of hoar frost on the boards but not on the heavy beams of garage doors, as the latter remain warmer for a longer time. The best explanation is that which ascribes the phenomenon to the hollow space between the inner and outer walls. The hollow space acts like a chimney in which warm air ascends so that warm air from the interior reaches the tiles above the hollow wall. *Subject Headings:* **1. Snow on roofs 2. Insulation effects.**—*I.L.D.*

10.1–302 551.578.46:539.8

Furukawa, Iwao, **Snow pressure on slope.** *Researches on Snow and Ice*, Tokyo, No. 1:197–202. Nov. **1953.** 7 figs. In Japanese. **DWB**—Maximum possible creeping pressure P and max of deposited snow cover along slopes are roughly estimated as P max $\alpha \cdot \rho \cdot H \cdot A$, where H is the maximum possible depth of snow cover, A the area of snow cover which could be considered to have an influence to the specimen, ρ the density of snow cover and α a coefficient, which has not been analyzed here, and could be a function of slope. *Subject Headings:* **1. Snow cover pressure 2. Snow cover on slopes 3. Snow density.**—*H. Arakawa.*

10.1–303 551.578.71:551.509.616:551.576.11

Soulage, G., **Augmentations du pouvoir glaçogène de l'air réalisées au cours d'expériences de prévention de la grêle.** [Increases in the ice forming power of the air, occurring during hail prevention experiments.] *Puy de Dôme. Observatoire, Bulletin*, Ser. 2, No. 4:121–141, Oct./Dec. **1957.** 8 figs., 4 tables, 17 refs. English summary p. 121. **DWB**—A study of the increases of the ice forming power of the air, obtained by H. Dessens in his experiments of hail prevention, is described. This study has been limited to measurements of the ice forming power on the ground. It has included, on the one hand, the determination of the natural variations of the ice forming power in the absence of silver iodide smoke, on the other hand, during seedings, counts of ice crystals upwind and in the protected area. The measurements of ice forming power have been carried out with mixing clouds chambers, set in a moving laboratory and in which the ice crystals were counted after their precipitation and their growth in a solution of sugar and water. The results of these measurements make evident the sporadic character of the increases realized with the burners of the "Association d'Etudes." Several explanations of that phenomenon are considered: a preponderant vertical diffusion, a local inactivation of silver iodide nuclei, the narrowness of the diffusion plumes associated with a fluctuation of the wind around its mean direction, an irregular course of the burners. Among these explanations, the last two seem the most plausible. At last, the observed increases were appreciable but they multiplied the ice forming power of the air by a factor smaller than ten. *Subject Headings:* **1. Hail prevention 2. Ice forming power 3. Cloud seeding 4. France.**—*Author's abstract.*

HYDROMETEOROLOGY

See also: **Hydrometry textbooks** (Bulakh et al.), 10.1–7; **Hydrology of Amu Darya delta, U.S.S.R.** (Rogov), 10.1–22; **Forest run off, Ivory Coast** (Rougerie), 10.1–108; **Forest hydrology, Union of So. Africa** (Wicht, Schumann), 10.1–109; **Floods, Algeria** (Caroff, Sinthe), 10.1–295; **Floods, Ill Basin, Northeastern France** (Fontaine), 10.1–296; **Drying of the soil** (Hallaire, Hénin), 10.1–299; **Water balance of rice fields, Japan** (Sato, Funahashi), 10.1–320.

10.1–304 551.579:546.11.023

Begemann, F. (*Enrico Fermi Inst. for Nuclear Studies, Univ. of Chicago*), **The use of tritium in studies of hydrological problems.** *International Geophysical Year*, 1957/1958. *Annals*, 5(IGY Instruction Manual), Pt. 5:344–348, **1958.** 3 figs., 9 refs., eqs. **DWB**—Large quantities of man-made tritium have been added to the inventory of cosmogenetic tritium in the surface waters of the earth and have made it possible to study the hydrology of the Upper Mississippi Valley. It was possible to compute the total inward transport of ocean-water vapor into the Chicago area (100 cm/year), the amount of ocean-water vapor rained out and carried out (52 and 48 cm/year), the outward transport of re-evaporated groundwater (24 cm/year), using the annual rate of precipitation (77 cm) and the annual run-off in

vers (28 cm). Analysis of water samples taken at different distances from the coast would be ery worthwhile. It will also be interesting to study hydrological phenomena on a much naller scale, for example, the mixing rate and mixing time of hot springs. Some remarks re added about the size of the samples and the equipment required to perform tritium analysis. *ubject Headings:* **1. Tritium analysis 2. Hydrologic studies 3. Hydrologic cycle 4. Upper Mississippi Valley.**—*Author's abstract.*

10.1–305 551.579.5:551.574.4

Damagnez, J., **Les sources secondaires d'humidité et d'approvisionnement en eau des ols de la France méditerranéenne.** [The secondary sources of humidity and soil water ıpply in Mediterranean France.] *La Météorologie*, Paris, Ser. 4, No. 48:481–492, Oct./Dec. **957.** 3 figs., 4 tables, 11 refs. French, English and Spanish summaries p. 481. **DWB**— n examining the function of the capillary structure of the ground and of the meteorological onditions, the author studies the concealed condensation being produced in regions having a Mediterranean type of climate. He offers graphs reflecting results of his experiments and raws practical conclusions as to the influence of those contributions of dampness on vegetation n general. *Subject Headings:* **1. Soil humidity 2. Condensation on earth's surface.**—*Author's bstract.*

10.1–306 551.579.4:551.515.2

Bordne, Erich (*Dept. of Geog., Yale Univ., New Haven*), **Some hydrologic aspects of the ood of August 1955, in a Connecticut valley.** *Geographical Review*, N. Y., 47(2):211–223, pril **1957.** 12 figs., 20 refs. **DWB, DLC**—A geographic study of the Naugatuck flood Conn.) which was a consequence of the rainfall from Hurricane "Diane." The study includes detailed description of the relief, soils and land use in the Naugatuck Valley and the dis- ribution and intensity of precipitation, time and amount of ensuing runoff, evapotranspiration nd soil moisture before the hurricane, and rainfall values during the hurricane period. Data n precipitation are presented by graphs and isohyets. *Subject Headings:* **1. Floods, Naugatuck iver, Conn. (Aug. 1955) 2. Hurricane rainfall 3. Naugatuck River Valley, Conn.**—*I.L.D.*

10.1–307 551.482:551.579.4

Gentilli, J., **Seasonal river regimes in Australia.** *International Geographical Congress, 7th, Wash., D. C., Aug.* 1952, *Proceedings*, pub. **1956?** p. 416–421. 2 figs. **DWB** 912.6I61p), **DLC** (G56.158)—Flow of Australian rivers during the different seasons of the ear is described and data are given on the percentage in each month, and the mean flow of ıe various rivers. These same data are also presented in graphs, and a map of the Australian ver regimes is also reproduced. *Subject Headings:* **1. River flow 2. Australia.**—*I.L.D.*

10.1–308 551.482:551.579.4

Mokliak, V. I., **K osnovam rascheta transformatsii povodkov.** [Basis for the calculation the transformation of floods.] *Meteorologiia i Gidrologiia*, Leningrad, No. 1:37–40, **1958.** figs., 2 refs., 7 eqs. **DWB, DLC**—Existing calculations of continuous, gradually changing ovement of water are based upon the cross section velocity of the current. The various ethods of computation (method of characteristics, etc.) are complex and require hydraulic ıd geometrical data of the current and channel elements. The transformation of discharges ong the length of a river, from upper to lower lying points along a stretch without a tributary a continually moving current, is brought about by the following reasons: uneven velocities the cross section of the current and the fact that the velocities in the current change with ne under the influence of variable discharge. In the proposed method of calculation, the ovement of the current is regarded as spatial; in addition to inertial forces, the effect of ction is considered. Equations are developed for calculating the discharges, determined at rticular intervals of time in the entering point and separated into partial discharges by the efficient of the time of flow from the initial to final point. By summing up the partial scharges reaching the final point in unit time, the transformed discharges in the final point e found. The actual transformations are illustrated with specific examples. *Subject eadings:* **1. River discharges 2. River currents 3. Current velocities 4. Current flow easurement.**—*I.L.D.*

10.1–309 551.579.5:6

Bialyĭ, A. M., **Vlazhnost' pochvy pri zaviadanii rasteniĭ.** [Soil moisture content during wilting of plants.] *Pochvovedenie*, Moscow, No. 2:31–41, **1957.** 15 tables, 14 refs. English summary p. 41. **DLC**—The author summarizes the results of experiments on the moisture content of the soil during the wilting of plants, carried out over a period of years in southeastern U.S.S.R. The investigations have shown that the maximum hygroscopic capacity of the soil can be used as an index of the sparsely available water for annual plants. The maximum molecular water retention capacity of the soil cannot be identified with the "critical moisture" or the "inert reserves" because this constant possesses easily available water for all the cultivated plants. The limit of water availability to plants is determined not only by the properties of the soil but also by those of the plants. For annuals the sparsely available water is close to the coefficients of Briggs and Schantz; for potatoes it is sometimes higher—1.8 times the maximum hydroscopicity. The average data over many years of residual water supplies under all kinds of cultivated plants, except young wheat, may serve as indices for characterizing soil water unavailable to plants. Extensive numerical data are presented in tables. *Subject Headings:* **1. Soil moisture 2. Soil moisture availability 3. Plant wilting 4. Southeastern U.S.S.R.**—*I.L.D. and author's abstract.*

10.1–310 551.579.

Blagoveshchenskiĭ, E. N., **O zadachakh Karakumskoĭ stantsii v sviazi s lesomeliorativnymi meropriiatiiami v pustyniakh.** [Problems of the Kara Kum station in connection with reclamation measures in deserts.] (In: Akademiia Nauk SSSR. Botanicheskiĭ Institut **Pustyni SSR i ikh osvoenie,** Vol. 2. Moscow, Izdat. Akad. Nauk SSSR, **1954.** p. 181–190, 3 figs., 19 refs.) **DLC**—This article is in part an analysis of the soil moisture regime, including the accumulations of moisture in the deep soil horizons, the movement of moisture from ground water into the soil, the role of precipitation, etc. The distribution of mean annual soil temperature as a function of heat balance is illustrated by a graph. *Subject Headings:* **1. Soil moisture 2. Soil moisture movement 3. Kara Kum, U.S.S.R.**—*I.L.D.*

10.1–311 551.579.

*Farský, Imrich, **Navlhčenie piesčitohlinitých pôd daždom a závlahou postrekom.** [Moistening of sandy clay soil by rain and by sprinkling.] *Vodohospodársky Časopis*, Bratislava 2(2):207–213, **1954.** 14 figs., tables, 5 refs. **DLC**—Soil moisture data to 50 cm depth obtained in experimental fields of sugar beet and corn during rainfall and sprinkling in summer 1953 are graphically presented and discussed. Water retention by sandy clay soil is found to be inadequate, as rain penetrated the entire depth of 50 cm in every case investigated, except one when the rainfall amount was only 5.6 mm. *Subject Headings:* **1. Soil moisture data 2. Soil moisture retention 3. Sandy clay soil porosity.**—*G.T.*

10.1–312 551.579.

Hallaire, Marc and Hénin, Stéphane, **Sur la non-validité de l'équation de conductivité pour exprimer le mouvement de l'eau non saturante dans le sol.** [The nonvalidity of the conductivity equation to express the motion of nonsaturating water in the soil.] *Académie des Sciences, Paris, Comptes Rendus*, 246(11):1720–1722, March 17, **1958.** 1 fig. **DLC**—The authors show that, if the equation of fluid circulation:

$$q = \lambda \frac{d\psi}{dz},$$

in which q = the flow following a direction $z'z$, λ = a conductibility coefficient, and, ψ = the potential acting on the water, is not applicable in expressing the movement of non-saturating water in the soil, it is because the direction given to the potential is not correct. This supposes the existence, for a given rate of humidity, of an efficient potential different from the one measured in laboratories without any liquid movement. The susceptible factor to define the efficient potential should be the frequency and the quality of the contacts between the liquid films. *Subject Headings:* **1. Water motion in the soil 2. Soil moisture profiles.**—*A.V.*

CLIMATOLOGY AND BIOCLIMATOLOGY

CLIMATE OF PARTICULAR PLACES

See also: **Hydrology of Amu Darya delta, U.S.S.R.** (Rogov), 10.1–22; **Climate, Pakhra River Basin, Moscow** (Abramovich), 10.1–23; **Climatic atlases, Rumania,** 10.1–36; **Climate, South Atlantic,** 10.1–39; **Climate, Isachsen, N.W. Territories, Canada,** 10.1–50; **Climate, Shackleton, Antarctica** (Stewart), 10.1–53; **Climate, Mawson, Antarctica** (Shaw), 10.1–57; **Climatic charts of Germany** (Creasi, Wallace), 10.1–71; **Climatic charts of Western Pacific** (Bender, Vitale), 10.1–72; **Climatic maps, S.W. Pacific** (Vitale), 10.1–73; **Aeronautical climatology of W. & Eq. Africa** (Welter, Suraud), 10.1–98; **Industrial climatology** (Landsberg), 10.1–112; **Mt. meteorological stations, Argentina** (Prohaska), 10.1–135; **Monthly climatic bulletins, Vera Cruz, Mexico,** 10.1–137; **Climatological data, Belgium** (Sneyers), 10.1–138; **Agricultural climatology, Czechoslovakia** (Nuttonson), 10.1–328; **Agricultural climatology, Poland** (Nuttonson), 10.1–329; **Bibliog. on works of C. E. P. Brooks,** p. 99.

10.1–313 551.582.1/2(675)

†*Vandenplas, A., **Données complémentaires sur le climat du Congo Belge.** [Supplementary data on the climate of the Belgian Congo.] *Belgium. Institut Royal Météorologique,* ol. 33, 1949. 73 p. numerous tables and figs. Bibliog. at end of each chapter. **DLC** QC991.C7V3)—A description and analytic discussion of the humidity, evaporation, solar adiation and cloudiness in the Belgian Congo. Ch. 1, Humidity, contains a list of the temerature-humidity recording stations in the Belgian Congo, the formulas for expressing atiospheric pressure and relative humidity, the instrumentation for recording relative humidity, nnual and monthly distribution of humidity, annual variation of relative humidity, vapor ressure and saturation deficit, diurnal variation of relative humidity, and variability of tmospheric humidity. Ch. II, Evaporation, discusses the instrumental measurement of vaporation including the Piche and Wild evaporimeters, monthly, annual and diurnal variation evaporation, variability of evaporation, annual and daily amplitudes of evaporation, and the nnual amount of possible and effective evaporations. Ch. III, Radiation, Insolation and loudiness, contains an account of measurement of global radiation and its measurement with ie Bellani (principle of distillation) instrument, monthly, annual and diurnal variation of obal radiation, and its variability, and annual and daily variation of insolation and cloudiness. umerous graphs and tables are interspersed in the text and extensive data on humidity and vaporation are included as appendices to Chapters 2 and 3, respectively. *Subject Headings:* **Climatic data 2. Climate of the Belgian Congo 3. Evaporation 4. Belgian Congo, S. entral Africa.**—*I.L.D.*

10.1–314 551.582.2(689)

†Whittlesey, Derwent (*Harvard Univ.*), **Southern Rhodesia: an African compage.** *Associaon of American Geographers, Annals,* 46(1):1–97, March **1956.** 73 figs. (mostly photos),) refs. **DWB, DLC**—In this regional study, the author discusses briefly the climate of outhern Rhodesia, giving a map of the mean annual precipitation and temperature and a table distribution of rainfall amount over area. *Subject Headings:* **1. Climate of Southern Rhodesia Southern Rhodesia.**—*I.L.D.*

CLIMATIC CHANGES

See also: **Glaciation** (Hoppe, Liljequist), 10.1–84; **Climatic variations and trends, Tokai District, Japan** (Kato et al.), 10.1–245; **Bibliog. on works of C. E. P. Brooks,** p. 99.

10.1–315 551.583.15

Kraus, E. B. (*Snowy Mts. Hydro-Elec. Authority, Cooma North, New South Wales*), **Recent matic changes.** *Nature,* London, 181(4610):666–668, March 8, **1958.** 6 figs., 8 refs., eqs. **WB**—The evidence for climatic changes during the period 1881–1940 is presented by analyzing ta for rainfall and stream flow for tropical and extratropical points by means of graphs of mulative percentual deviations from the mean. The cumulative percentual deviations are resented by

$$y(n) = 100 \sum_{l=1881}^{n} \left(\frac{r_l}{r-1} \right),$$

where n represents the running calendar year, r_t the rainfall or stream discharge for the yea l, $\bar{r}$ the mean for the period 1881–1940 and y—ordinate. The graphs for y are used for $r_t >$ and vice versa. The percentual deviation from r of the means for any other period, such as to $m+n$ is given by

$$[y(n+m)-y(m)].$$

Diagrams are presented showing fluctuations in N.W. New South Wales, Queensland Coas Carolina Coast of Charleston and Cape Hatteras, India, Nile discharge at Aswan and Centra Cape Provinces of South Africa. In the subtropics, precipitation was generally above th 1881–1940 mean during the nineteenth century. "A dry period associated with a widenin of the arid belts set in abruptly at end of the century. This lasted with only short interruptio until a return of consistently wetter conditions in recent years." "In climatically correspond ing locations the changes occurred simultaneously north and south of the equator." Possibl explanations are presented. These involve changes in solar radiation influencing the ozon layer in the tropics and thereby radiational cooling in the troposphere; the association o magnetic perturbations with pressure rises at 60°–70°N and falls at 40°N and the dependenc of magnetic disturbances upon solar corpuscular streams; and variations in dust conten *Subject Heading:* **1. Climatic variations.**—*I.L.D.*

10.1–316 551.583.1:551.311.1

†*Mubashir, L. K. (*Univ. of the Punjab, Lahore*), **Climatic fluctuations in the outer Himalaya and adjacent parts in West Pakistan during the past century.** *Pakistan Journal of Scienc* Lahore, 9(5):202–208, Sept. **1957.** fig., tables, 21 refs. **DWB**—Various authorities regardin world-wide (especially Central Asia) climatic changes in the last century are cited to confir the evidence from instrumental and glacial data in the Lahore, Muru and Peshawar (187 1955) sections of West Pakistan. Lahore shows an increase in temperature averaging 0.5° in Dec. and 0.22°F for July. The other 2 stations show a decrease in temperature, in keepin with the general tendency in middle Asia. Glaciers in the Karakoram and Himalaya area have advanced recently in some sectors and have been stationary or fluctuating in other Rainfall fluctuations have been correlated with sunspot cycles but with no significant succes *Subject Headings:* **1. Climatic variations in West Pakistan 2. West Pakistan.**—*M.R.*

10.1–317 551.583.1

†Roulleau, Maud, **Variations récentes du climat.** [Recent climatic changes.] *La M téorologie*, Paris, Ser. 4, No. 49:1–14, Jan./March **1958.** 12 figs., 32 refs. French, Englis and Spanish summaries p. 1. **DWB**—When working out the averages of meteorological dat covering 30 yrs (temperature, pressure, height of precipitations) obtained in two consecutiv periods of 20 or 30 yrs, various authors have thrown light on the existence of variations climate on the face of the globe. To explain those changes, several theories have been pu forward; they are examined successively but none seems to be able to take account of th phenomena as a whole. *Subject Heading:* **1. Climatic changes.**—*Author's abstract.*

10.1–318 551.583

Öpik, E. J. (*Armagh Obs., Northern Ireland*), **Ice ages.** (In: Bates, D. R. (*ed.*), **The ear and its atmosphere.** N. Y., Basic Books, **1957.** p. 152–173. 4 figs., 2 tables.) **DLC**— Climates of the past, present day glaciation or ice sheets, effect on sea level and isostas quaternary climates, and the cause of ice ages are discussed and illustrated schematicall *Subject Headings:* **1. Ice Ages 2. Glacial periods.**—*M.R.*

MICROCLIMATOLOGY

See also: **Microclimatology texts** (Brooks), 10.1–13; **Aerostat soundings, Moscow** (Deviatova), 10.1–14; **Forest run off, Ivory Coast, Africa** (Rougerie), 10.1–108; **Microclimatic control, Central Asia** (Aĭzenshtat), 10.1–180.

10.1–319 551.584:551.5

†Charnock, H. (*Natl. Inst. of Oceanog., Wormley*), **Meteorology.** *Science Progress*, Londo 46(183):470–487, July **1958.** 4 figs., 35 refs., 11 eqs. **DLC**—A review of recent progress

udy of the structure of the atmosphere near the ground; especially the profiles of wind and mperature and humidity. Both theoretical and dimensional considerations, under neutral nonneutral conditions, and predictions based on Reynolds' analogy between the transfer heat and momentum, refinements by HOLZMAN and LETTAU and recent extensions by MONIN id OBUKHOV, and by PRIESTLEY and TAYLOR for nonsimilar profiles, the Bowen ratio, profiles id their measurements, fluxes and statistical results are described and illustrated graphically. *ubject Headings:* **1. Micrometeorological profiles 2. Turbulence theory 3. Turbulent ansport above ground.**—*M.R.*

10.1–320 551.584:551.579:633.18

Sato, Shoichi and Funahashi, Y., **Studies on the net duty of irrigating water for the paddy eld in the warm districts in Japan.** *Journal of Agricultural Meteorology*, Tokyo, 10(1/2):4–6, ec. **1954.** 2 figs., 3 tables. In Japanese; English summary p. 6. **DWB**—The three elements water loss in the paddy field—evaporation from water surface, transpiration from the rice ants and percolation to the depth of ground were measured. Results are given in tables and . Evaporation from water surface in the paddy field gradually decreased with the lapse growing time and became almost constant after late Aug. Transpiration increased with the pse of growing time, and showed two peaks in the cultivating term. The first peak is at the r-developing stage (late Aug.) and the second at the early stage of ripening (late Sept.). ercolation was great in midsummer with continuous clear weather, and exudation was great rainy season (Bai-u and early autumn). The great percolation or exudation depends on the cal topography, soil structure, and underground water level. *Subject Headings:* **1. Water lance of rice fields 2. Rice culture 3. Japan.**—*Authors' abstract.*

10.1–321 551.584:551.525/6:631.67:623.18

Sato, Shoichi, **Microclimatic studies on some methods of irrigation in the rice-field, Pts. 6.** *Journal of Agricultural Meteorology*, Tokyo, 10(1/2):7–15, Dec. **1954.** 12 tables. In panese; English summary p. 10 and p. 15. **DWB**—In northern Japan, close attention has en paid to the temperatures of rice fields in reference to the injuries of low temperature to the ce plant. In the plains of southwestern Japan, the conditions are the contrary. It should noticed that the water- and soil-temperatures become so high, the customary management irrigating water is unfavorable for crop growth in the mid-summer season. [See Tables 1 id 2.] In the plains of southwestern Japan, the artificial regulation to lower the water- and il-temperatures in the rice field is more favorable for crop growth than the customary manage- ent of irrigation (irrig. with stagnant water). One of the methods to lower the field-tem- ratures is irrigation with running water. Several experiments for the above mentioned enomena were performed from 1947 to 1952, and the results obtained are shown in tables. here is no need to irrigate with running water during the whole irrigating term. The temp.- gulation taken only in summer season exerts fairly good effects on the crop. (For Pt. 3, 3.10–212, Oct. 1952, *MAB*; for Pt. 4, *see* Oct. 1955, *MAB*.) *Subject Headings:* **1. Rice eld temperatures 2. Irrigation water temperature 3. Japan.**—*Author's abstract.*

10.1–322 551.584:551.525/6:633.18:631.86

Sato, S. (*Kyushu Agric. Exper. Station*), **Studies on the methods to lower the high tem- ratures of paddy field in the warm district in Japan: mulching with rice-straw and grass reliminary report).** *Journal of Agricultural Meteorology*, Tokyo, 11(1):39–40, July **1955.** ble. In Japanese; English summary p. 40. **DWB**—Too high temperature of the paddy ld is not favourable but somewhat injurious for the rice crop growth. One of the methods avoid such high temperature is the continuous running-water irrigation, but this method nnot be used in cases where there is a lack of irrigating water. Here, the efficiencies of other technique—mulching in the field—were investigated. Such materials as dry rice raw or mown grass scattered on the water surface check the loss of evaporation heat but nder the penetration of solar radiation into the water and soil surface. Therefore, the daily aximum temperatures of water and of soil in the covered field (with mulching) become to some gree lower than those in the unmulched field. *Subject Headings:* **1. Rice field temperatures Mulch 3. Field microclimatology 4. Japan.**—*Author's abstract.*

10.1–323 551.584.6

†Pratt, A. W. and Weston, J. C. (*both, Building Res. Station, Watford, Eng.*), **The thermal capacity of buildings.** (In: Building Research Congress, Garston, 1951, **Papers presented in Division 3.** pub. **1951.** p. 88–93. 4 figs., 3 tables, 24 refs. **DWB** (624 B932p)—Examples of the effects produced on different methods and construction by nonsteady flow are presented. The authors analyze theoretically and present experimental data on variable heat flow through a homogeneous and composite roof and walls, the rate of heating up of rooms, and the heating up of buildings during intermittent heating periods. *Subject Headings:* **1. Heating 2. Indoor temperatures.**—*I.L.D.*

10.1–324 551.584.3:551.524.37:634.

Bouchet, R., **Etude microclimatique dans le vignoble aubois. Influence de certains facteurs locaux et culturaux sur l'aggravation du risque de gelée.** [Microclimatic study in the Aube wine region. Influence of some local and cultural factors on the increase of frost risks.] *Académie d'Agriculture de France. Procès Verbal,* Feb. 19, **1958.** Reprint of 6 pages, 3 figs.—The author gives evidence of the influence of slight variations of relief on the increase of the frost risks. He also reveals the bad results of the parcelling out of vineyards. The suppression of waste land should be accompanied by a new distribution of forest clumps, which should reduce considerably the damages recorded in the Aube wine region. The suppression of waste land above and along the vineyards should allow a gain of 1 to 2 degrees in the minimum temperature and should reduce, by more than a half, the frost risk. *Subject Headings:* **1. Vineyard microclimatology 2. Forest effects on vineyard temperature 3. Frost damage prevention 4. Urville, France.**—*A.V.*

10.1–325 551.584.61:697.

Shafir, A. I.; Panshinskaia, N. M. and Solomonova, E. I., **Opyt gigienicheskoĭ kharakteristiki razlichnykh tipov ventiliatsii v zhilykh zdaniakh.** [Experiment on the hygienic characteristics of various types of ventilation in dwelling houses.] *Gigiena i Sanitariia,* Moscow, 22(1):18–25, Jan. **1957.** 4 figs., table, refs. **DLC**—The different types of ventilation of dwelling houses have been investigated. The ventilation system type "V" with aeration installations in each room and extract ventilation from W.C., bathroom and kitchen, and as regards hygienic requirements, proves to be sufficiently effective and may be widely used in the building of dwelling houses with small apartments. The ventilation system type "A" has extraction ducts from each room, and in case of insufficient extraction of air from W.C., bathroom and kitchen, there may form an air flow from the kitchen and other accessory premises into the living rooms. Ventilation system type "B" with extraction from W.C., bathroom and kitchen, has been most widely used in the building of new dwelling houses in Leningrad but it does not provide sufficiently favorable indicators of air condition and the feeling of comfort by the people. The conditions of air-exchange in ventilation type "G," with supply and extract ducts in living rooms, are somewhat worse than ventilation type "V," because in case of insufficient extraction from W.C., bathroom and kitchen, the ventilation ducts in the living rooms make it possible for polluted air to penetrate into them. The present-day ventilation installations of the gas-supplied kitchens and of the adjacent premises of bath and W.C. do not provide for effective elimination of harmful admixtures from the air. This makes it necessary to improve the ventilation of W.C., bathroom and kitchen and the quicker use of gas stoves provided with installation for extraction of products of gas combustion into the flue. *Subject Headings:* **1. Indoor air 2. Building climatology 3. Ventilation**—*Authors' abstract.*

CLIMATIC CLASSIFICATION

See also: **Arid zone climatology symposia,** 10.1–6.

10.1–326 551.585(436,43)

Koňcek, Mikuláš (*Bratislava*), **Die Klimagebiete Österreichs auf Grund natürlicher Kriterien.** [Climatic regions of Austria based on natural criteria.] *Wetter und Leben,* Vienna, 9(10/12):137–143, **1957.** 2 tables, eqs. **DLC**—The author describes in detail the method of climatic classification developed by him in order to classify Czechoslovakia in

natural climatic regions. The criteria employed included the mean Jan. temperature to describe continentality, number of summer days (days with maximum temperature $\geqq 25°C$), maps of temperature totals of the period with mean temperatures $\geqq 5°$, $\geqq 10°$ and $\geqq 15°C$, the humidity index proposed by the author and determined by the equation $I_z = R/2 + \Delta r - 10t - (30 + V^2)$, and the data on the maturing wheat. In the above formula, R—total precipitation in mm during the growth period April–Sept., Δr positive deviation of precipitation amount during three winter months, Dec.–Feb., from 105 mm (negative deviations are not considered), t—mean temperature of the entire growth period in centigrade and V—mean wind velocity at 1400 o'clock in m/sec during the entire growth period. This moisture index is compared with that of THORNTHWAITE. The climates into which Czechoslovakia is divided are described. This procedure is applied by the author to the classification of Austria into natural climatic regions. Numerical data on the meteorological elements (monthly temperature, number of summer days, precipitation, etc.) for individual stations for the various provinces, maps showing the moisture index distribution and the climatic regions and zones are presented. The climatic region of Austria and of Czechoslovakia are compared and the geographical distribution of the climatic regions and zones of Austria are discussed. *Subject Headings:* **1. Climatic regions 2. Climatic classifications 3. Czechoslovakia 4. Austria.**—*I.L.D.*

BIOCLIMATOLOGY

See also: **Agric. bioclimatology** (Geslin), 10.1–102; **Climatic data, France** (Geslin), 10.1–105; **Spruce bark beetles, Germany** (Wild), 10.1–110; **Temp. effects on heart disease** (Burch, Hyman), 10.1–118; **Climatic effects on epilepsy, Peru** (Sal y Rosas), 10.1–119; **Annual sultriness regime, Africa** (Schulze), 10.1–120; **Temp. and insolation effects on plants, Neuchâtel** (Primault), 10.1–142; **Sleeping bag temps.** (Dodd), 10.1–249.

10.1–327 551.586:615.8(497.2)

Kirov, K. T., **Klimatichno-kurortnite raĭoni v Bulgariia.** [Climatic health resorts in Bulgaria.] *Priroda*, Sofia, 1(3):48–51, May/June **1952. DLC** (Q4.P78)—A general discussion no data or illustrative material) of the "climatic" health resorts on the Black Sea Coast, on the plains and in the mountains of the interior, and their relative merits in different seasons. *Subject Headings:* **1. Climatic health resorts 2. Resort climates 3. Bulgaria.**—*M.R.*

10.1–328 551.586:63:551.582.1(437)

*Nuttonson, Michael Y., **Agricultural climatology of Czechoslovakia and its agroclimatic analogues in North America.** *International Agro-climatological Series, Study* No. 3, **1947.** 2 p. tables, bibliog. **DLC**—The geography and climate of Czechoslovakia are discussed and climatic analogues in North America found. A table containing data on mean monthly temperature, relative humidity and precipitation, on absolute temperature, on average killing frost dates, duration of average frostless periods and on precipitation effectivity indexes is presented for 67 meteorological stations. The location of the stations is shown on a chart with indication of altitude and references to North American climatic analogues. *Subject Headings:* **1. Agricultural climatology 2. Climatic analogues 3. Climate of Czechoslovakia . Czechoslovakia. I. American Institute of Crop Ecology, Washington, D. C.**—*G.T.*

10.1–329 551.586:63:551.582.1(438)

*Nuttonson, Michael Y., **Agricultural climatology of Poland and its agro-climatic analogues n North America.** *International Agro-climatological Series, Study* No. 2, **1947.** 12 p. tables. **DLC**—The geography, climate, and winter and spring crops of Poland and adjacent parts of East Germany are discussed and compared with their analogues in North America. A table containing data on mean monthly temperature, relative humidity and precipitation, on absolute temperature, on average killing frost dates, duration of average frostless periods and on precipitation ,effectivity indexes is presented for 86 meteorological stations. The location of the stations is shown on a chart with indication of altitude and references to North American climatic analogues. *Subject Headings:* **1. Agricultural climatology 2. Climatic analogs 3. Climate of Poland 4. Poland. I. American Institute of Crop Ecology, Washington, D. C.**—*G.T.*

10.1–330 551.586:63

Nuttonson, Michael Y., **International cooperation in crop improvement through the utilization of the concept of agroclimatic analogues.** *Institute for International Collaboration in Agriculture and Forestry, Prague, Interagra,* 1(3/4), **1947.** 8 p. charts. Abstracted from reprint. **DWB**—The author stresses the usefulness of comparative agricultural climatology for the purpose of plant introduction and international plant exchange. He refers to his studies in which he analyzed agroclimatic conditions in various countries indicating their analogues in the U. S. (most of these have been abstracted in Vol. 2, 1951, *MAB*). Maps of the Ukraine, Czechoslovakia and Yugoslavia are presented. They show climatic regions of the country with references to corresponding climates in the U. S. *Subject Headings:* **1. Climatic analogs 2. Agricultural climatology 3. Ukraine 4. Czechoslovakia 5. Yugoslavia 6. United States.**—*G.T.*

10.1–331 551.586:633.11(52)

Noda, K.; Kumamoto, T.; Ibaragi, K. and Eguchi, M. (*all, Kyushu Agricultural Experiment Station*), **Growing process of wheat plant when the air temperature during winter season is extremely abnormal and relatively higher. (Studies on the growing process of wheat and naked barley in the warmer district of Japan, Pt. 4.)** *Journal of Agricultural Meteorology,* Tokyo, 11(2):71–75, Oct. **1955.** 4 figs., table, 14 refs. In Japanese; English summary p. 75. **DWB**—In order to add information for clarification of mechanism of yield lowering induced by the abnormal condition of air temperature during winter season as seen in 1954, we observed the growing process of wheat plants (variety; Norin No. 61, spring type) from Jan. to April 1954 and compared it with 1952. Results are as follows: 1. Air temperature from Jan. to March in 1954 was somewhat higher than in 1952 and furthermore the irregular variation (rising at middle Jan. and Feb., and dropping at early Feb. and middle March) was seen. However, no essential difference in the amount of rainfall and the hours of sunshine was found between 1952 and 1954. 2. Rapid elongation of plant height and culm shooting in 1954 were begun at earlier date of growth than in 1952. Stem number in 1954 increased rapidly from early Jan. and gained the nearly maximum number at middle Feb., though in 1952 it increased slowly at first, became rapid gradually in increasing velocity with progress of growth and a time of the nearly maximum number corresponded to about early March. On the other hand the beginning time of its decreasing was nearly simultaneous in both years. Consequently the time duration keeping the nearly maximum number in 1954 was about 20 days longer in 1952. 3. A stage of bract primordia differentiation (stage V stated by WADA) was about 30 days earlier in 1954 than in 1952, while a stage of flower organ differentiation (stage X) was about 15 days earlier alone: accordingly, the time duration from stage V to X was about 15 days longer in 1954 than 1952. From this fact it is considered that the probability of lowering of yield was included on higher percentage in wheat plant of 1954, because the early period of spike formation is apt to be affected by various environmental factors as seen hitherto in several reports. 4. Dry matter percent in plant body during Jan. to Feb. in 1954 varied ranging from 10 to 15%, though in 1952 continued in about 15% level, that is in 1954 it was relatively lower and had striking variation. Next, when seen the increasing curve of total nitrogen and decreasing ones of carbon compounds (total carbohydrate, reducing sugar and invert sugar) of plant body, the clear difference could be found between both years. Thus it is supposed from these results that the growing habit of the wheat plant in 1954 also differed physiologically from that in 1952. *Subject Headings:* **1. Temperature effects on crops 2. Wheat culture 3. Japan.**—*Authors' abstract.*

10.1–332 551.586:633.16

Garnier, Marcel, **Influence des conditions météorologiques sur le rendement de l'orge de printemps.** [Influence of meteorological conditions on the yield of spring barley.] *La Météorologie,* Paris, Ser. 4, No. 44:355–361, Oct./Dec. **1956.** French, English and Spanish summaries p. 355. **DWB**—This influence of meteorological conditions on the yield of spring barley was investigated at Maule (near Mantes, in Seine-et-Oise) in the region of Paris on the barley variety "Aurore." The study includes an analysis of the effect of winter, the influence of spring including preparation of soil and sowing, period of tilling (end of March to end of

April), growth (May–end of June), spike formation-flowering (June 1–15) and maturation (June 15–July 15). Data on yields for 1949 and 1952 indicating the effect of rainfall and heat are presented. A warm March with low rainfall favors early sowing and rapid and regular growth. In April and May the rain is not very important if the weather is cool; rains should fall towards the end of April (tilling) and end of May–beginning of June (spike formation). In June–July a relative drought is more favorable if it is accompanied by temperatures below normal. The protein content is enriched by high temperatures. From the point of view of climatic requirements, spring barley resembles wheat but it withstands less successfully persistent spring rains and high summer heat because its cycle is shorter, its roots more shallow and its form is more feeble. *Subject Headings:* **1. Barley ecology 2. Barley 3. Maule, France.**—*I.L.D.*

10.1–333 551.586:633.18

Nakahara, M. and Mitsutera, M. (*Meteorological Res. Inst., Tokyo*), **Application of factor analysis to the yield of rice-crop experiments, Pt. 1.** *Journal of Agricultural Meteorology*, Tokyo, 7(3/4):83–85, Nov. **1952.** 2 figs., 3 refs. In Japanese; English summary p. 85. **DWB**—The yield of rice-crop results from the total sum of all the influences of environment from the time of planting to harvesting, including the quality of the seed, the condition of the soil, and the social condition. For the analysis of the influences of environment, a method of factor analysis has been applied similar to that adopted in the medical studies for the data on the yield of rice, for both early and middle season crops, resulting from the rice-experiments in 20 agricultural experiment stations of Japan covering the period of 30 yrs from 1911 to 1940, and which obtained the coefficient of the first and second factors shown in tables 1 and 2. *Subject Headings:* **1. Rice culture 2. Climate and crop yield.**—*Authors' abstract.*

ENVIRONMENTAL INFLUENCES

See also: **Agricultural bioclimatology** (Geslin), 10.1–102; **Forest hydrology, Union of So. Africa** (Wicht, Schumann), 10.1–109.

10.1–334 551.588.1:551.468

Putnam, William C. (*Univ. of Calif., L. A.*), **Classification and identification of coastal zones of the world.** [In: U. S. Office of Naval Research, **Coastal geography conference, Feb. 18, 1954.** Wash., D. C., **1954?** p. 63–71. 7 figs. (incl. photos.).] **DLC** (GB451.U53)—Coastal zones of the world can be classified dynamically according to uplift or depression signs, or according to erosion processes (ice, glaciers, wind, water, coral, etc.). The scheme becomes complicated by the various land forms on which these agents operate. Examples are given and aerial photographs showing a few types presented. The classification is for use on a uniform set of coastal charts for the world, on which will be shown landforms, basic climatic elements (avoiding the detailed climatic classification schemes) and other features such as vegetation, rock forms, etc. *Subject Headings:* **1. Coastal zone classification 2. Climatic effects on coasts.**—*M.R.*

10.1–335 551.588.3 551.5:631.4

†Landsberg, Helmut E. and Blanc, Milton L., **Interaction of soil and weather.** Paper for presentation before the Soil Physics Div., American Society of Agronomy, Atlanta, Georgia, Nov. 18, 1957. Wash., D. C., U. S. Weather Bureau, **1957.** 13 p. 21 refs. **DWB** (M88.3 U587i)—The importance of radiation, albedo, soil and air temperature, turbulence near the ground, soil moisture gains due to precipitation, condensation and absorption, and losses due to evaporation, transpiration and percolation of ground water, heat budget (convection, storage in soil and evaporation), soil gases and chemistry (CO_2, N, etc.), possibilities and methods of microclimate control (changing radiation, albedo, moisture or heat transfer by dust coverings, shelter hedges or slope changes) and effects on various crops, instruments used especially for microclimatic studies, etc. are discussed and quantitative examples given briefly. *Subject Headings:* **1. Crop microclimatology 2. Microclimatic control 3. Soil-atmosphere interaction.**—*M.R.*

MISCELLANEOUS

COSMIC INFLUENCES

See also: **Global radiation measurements during eclipse, Suwalki, Poland** (Grzedzielska, Zakrent), 10.1–228; **Radio wave propagation** (Eshleman), 10.1–351; **Meteor ionization trails** (Manning), 10.1–352.

10.1–336 551.590.21:550.386

†Akasofu, Syun-ichi, **Hydromagnetic relationships between the sun and the earth.** *Tôhoku Univ. Science Reports, 5th Ser., Geophysics*, 8(2):133–146, Feb. **1957.** 2 figs., 59 refs., 25 eqs. **DWB. DLC**—In this paper, the solar-terrestrial relationships have been considered, taking into account the hydromagnetic effect in the interplanetary gas. It is shown that a high pressure gas expelled from the sun produces the compressed layer in front of this 'Jet,' which advances with a supersonic speed into the interplanetary gas at rest. It passes through the outer atmosphere as a modified Alfvén-type shock wave. As discussed by KATO and WATANABE in the paper published in this issue, the solar streamers may be highly turbulent and force the oscillation of the outer atmosphere semiglobally, while oscillations may be observed as Pc type geomagnetic micropulsations on the earth. From the energy consideration, it is apparent that the denser streamer is more necessary than ever supposed. Magneto-hydrodynamic shock waves produced, affect the cosmic ray and may produce the cosmic ray storm. *Subject Headings:* **1. Solar-terrestrial relationships 2. Geomagnetic pulsations.**—*Author's abstract.*

10.1–337 551.590.21:551.510.535:551.510.7

Minnis, C. M. (*Dept. of Sci. and Indus. Res., Radio Res. Station, Slough*), **Solar activity and the ionosphere.** *Nature*, London, 181(4608):543–544, Feb. 22, **1958.** ref. **DWB, DLC**—Sunspot cycles are not associated with any appreciable change in the amount of visible light and heat radiation emitted by the sun; but they increase the intensity of the ultraviolet and X-radiation which is responsible for the existence of the E-layer of the ionosphere. As compared with 1954, the intensity of ultraviolet and X-radiation had increased threefold in 1957. Similar estimates of the intensity of the F-2 layer confirm the conclusions reached using the E-layer results. The large changes in the intensity of the ionizing radiation associated with the sunspot cycle produce corresponding variations in the structure and electron density of the layers of the atmosphere and influence the propagation of radio waves. During Oct. 1957, radio stations in the U. S. could be received in England on frequencies of 37.5 Mc/sec in the early afternoon. Even near sunspot in 1954, instances were not uncommon in which European radio stations, operating in the very high frequency band, interferred with television and other radio signals in Southern England. An examination of the twenty sunspot cycles which have occurred since 1749 shows that the present one and its predecessor must be regarded as having maxima which are well above the average. *Subject Headings:* **1. Sunspot effects on ionosphere 2. E layer 3. Ionospheric radio wave propagation.**—*I.L.D.*

10.1–338 551.590.25:551.594.12:621.396

Montgomery, G. F. and Sugar, G. R., **The utility of meteor bursts for intermittent radio communication.** *Institute of Radio Engineers, Proceedings*, 45(12):1684–1693, Dec. **1957.** 14 figs., table, 15 refs., 22 eqs. **DLC**—It has been suggested that the transient vhf signal produced by meteor ionization be used for communication, and several groups have been investigating this possibility. Analysis of the meteor bursts measured on the 49.8-mc transmissions from Cedar Rapids, Iowa, to Sterling, Va., implies that useful intermittent communication can be achieved. Transmission experiments in a 100-kc band have not realized the theoretical capacity of the signal, mostly because of multipath propagation. About half of the meteor bursts observed are unaffected by this distortion, however, so that a useful system of this bandwidth may yet be possible. *Subject Headings:* **1. Meteor ionization trail 2. Radio communication by meteor trails.**—*Authors' abstract.*

10.1–339 551.590.25:621.396

Vincent, W. R.; Wolfram, R. T.; Sifford, B. M.; Jaye, W. E. and Peterson, A. M., **A meteor-burst system for extended range VHF communications.** *Institute of Radio Engineers,*

Proceedings, 45(12):1693–1700, Dec. **1957.** 9 figs. (incl. photos), ref. **DLC**—A low-power burst communication system has been designed and tested, utilizing the intermittent propagation path provided by ionized meteor trails. A test circuit has been installed between Bozeman, Mont. (Montana State College), and Palo Alto, Calif. Details of the burst control techniques and storage devices used to handle the intermittent information flow are discussed, along with the overall system design. *Subject Headings:* **1. Meteor ionization trails 2. Radio communication by meteor trails.**—*Authors' abstract.*

10.1–340 551.590.25:621.396

Vincent, W. R.; Wolfram, R. T.; Sifford, B. M.; Jaye, W. E. and Peterson, A. M., **Analysis of oblique path meteor-propagation data from the communications viewpoint.** *Institute of Radio Engineers, Proceedings*, 45(12):1701–1707, Dec. **1957.** fig. 21, 8 refs. **DLC**—The characteristics of signals reflected from meteor trails have been extensively measured and analyzed to determine their usefulness in communications. The random nature of meteor sizes, radiants, velocities, time of striking the upper atmosphere, showers, etc., make precise determination of the various desirable propagation parameters difficult; however, gross characteristics such as duration, interval between usable signals, antenna direction effects, diurnal rate and duty cycle, and rate of signal decay are presented in a form usable to the design of communications circuits. *Subject Headings:* **1. Meteor ionization trails 2. Radio communication by meteor trails.**—*Authors' abstract.*

VISIBILITY

See also: **Atmos. transmittance and visibility photometers, Mass. and Maine** (Eldridge et al.), 10.1–16.

10.1–341 551.591:535.3

Toropova, T. P. (*Astrophys. Inst. Acad. Sci. Kazakh SSSR, Alma Ata*), **O razdelenii sostavliaiushchikh oslableniia sveta zemnoĭ atmosferoĭ.** [Analysis of the factors involved in the attenuation of light by the earth's atmosphere.] *Akademiia Nauk SSSR, Doklady*, 109(2):295–298, July 11, **1956.** 2 tables, graphs. **DLC**—This experimental study of the individual factors involved in the attenuation of light and the nature of light dispersion by the atmosphere was based on daily observations of optical densities of long waves in the spectral region $<1000\text{Å}<\lambda<11{,}000\text{Å}$. The author investigates the role of selective absorption by water vapor, scattering by air molecules and small particles, and scattering by large particles both dry and humid aerosols. *Subject Headings:* **1. Atmospheric attenuation 2. Light dispersion.**—*I.L.D.*

OPTICAL PHENOMENA

See also: **Flying saucers** (Constance), 10.1–34; **Night airglow luminance, Haut-Provence, France** (Cailliatte), 10.1–149; **Extinction coefficient of haze** (Gibbons), 10.1–236.

10.1–342 551.593.1:551.510.62

du Castel, François; Misme, Pierre and Voge, Jean, **Réflexion d'une onde électromagnétique par une couche d'atmosphère présentant une variation de l'indice de réfraction.** [Reflection of an electromagnetic wave on an atmospheric layer having a variation of the refractive index.] *Académie des Sciences, Paris, Comptes Rendus*, 246(12):1838–1840, March 24, **1958.** **DLC**—More general formulation of the reflection coefficient, which may be interpreted as an increasing function of the atmosphere thickness where great stability prevails, is presented. *Subject Headings:* **1. Atmospheric refraction 2. Electromagnetic wave.**—*A.V.*

10.1–343 551.593.12:551.552

Hosfeld, Roger and Hynek, J. Allen, **Field test of directional scintillometer.** Ohio. State Univ. Research Foundation, Contract AF 19(604)-2039, Scientific Report, No. 1, Sept. **1957.** 22 p. 17 figs. **DWB** (523.8 H825fi)—A specialized telescope utilizing a rectangular section of a parabolic mirror was used to make stellar scintillation observations for correlation with simultaneous winds aloft. Relatively good agreement was found between the azimuthal orientation of the rectangular mirror and the wind direction throughout the region from 3 or 4

km to 17 or 18 km. For winds at both lower and higher levels the agreement was poor. *Subject Headings:* **1. Scintillation observation techniques 2. Scintillometers 3. Wind direction.**—*Authors' abstract.*

10.1–344 523.73:551.593.12:551.557

Kazès, I. and Steinberg, J. L., **Etude de la scintillation du soleil observée avec plusieurs antennes sur la longueur d'onde de 3,2 cm.** [Study of the sun's scintillation observed by means of several antennae on 3.2 cm wavelength.] *Académie des Sciences, Paris, Comptes Rendus*, 245(7):782–785, Aug. 12, **1957.** 3 figs., 2 refs. **DLC**—Scintillation measurements made with three receivers located at variable distances allowed to state precisely the average size (170 m) of cast shadows on the soil and to compare their speed with the wind velocity at tropopause altitude. In spite of the distance between the stations, and the differences of several hours existing between meteorological and radioelectrical observations, winds of same directions are always observed. Scintillations are very likely produced in the low atmosphere at an altitude close to the irregularities responsible for optic scintillations. *Subject Headings:* **1. Radioastronomy 2. Sun scintillation 3. Upper-air wind 4. Nancy, Trappes, France.**—*A.V.*

10.1–345 551.593.5:517.512.2

Kogan, S. IA., **Primenenie metoda sfericheskikh funktsiĭ k zadache o rasseianii sveta v atmosfere.** [Application of harmonics to the problem of light scattering in the atmosphere.] *Akademiia Nauk SSSR, Izvestiia, Ser. Geofiz.*, No. 3:384–394, **1957.** 2 tables, 11 refs., 20 eqs. **DLC.** For English trans. see the English language edition of the **Izvestiia** (Bulletin of the Academy of Sciences of the U.S.S.R., Geophysics Series, issued by the American Geophysical Union.)—The problem of scattering of light is solved for a non-spherical scattering index and for the presence of albedo of an underlying surface. The problem of scattering of radiation is formulated in plane parallel atmosphere in the case of a nonspherical scattering index, and it is solved by the method of harmonic analysis. This problem is analyzed for satisfactory limiting conditions. The formulae for determining the intensity of radiation scattering take into account the albedo of the earth's surface. Examples of calculations of the intensity of radiation scattering by harmonic relations of spherical and non-spherical scattering indices are presented. *Subject Headings:* **1. Scattering of light 2. Harmonic analysis.**—*I.L.D.*

10.1–346 551.593.7

Dietze, Gerhard, **Einige Ergebnisse einer homogenen siebeneinhalbjährigen Messreihe der Maximalpolarisation.** [Results of a homogeneous seven-and-a half year series of maximum polarization records.] *Zeitschrift für Meteorologie*, 11(7):211–219, July **1957.** 7 figs., 2 tables, 10 refs. **DWB, DLC**—Over a period of 7½ yrs, 1950 measurement series of maximum polarization of the light of sky were carried out at hourly intervals at a cloud free point at a 90° angle from the sun. The procedure and instrumentation for making the observation are described. The maximum polarization decreases from the low to the middle solar altitudes and rises slightly at the highest solar elevations. Also, maximum polarization is higher during the forenoon at low solar elevation (5° to 20°) than during the afternoon. A strikingly good relationship exists between the maximum polarization and the actinometrically determined turbidity factor of Linke; at low turbidities the maximum polarization is high, and vice versa. The dependence of maximum polarization on solar altitude and turbidity, jointly, is discussed. Maximum polarization is highest in Arctic air masses and lowest in tropical air masses. The wind direction influences maximum polarization by way of the aerosol content of the atmosphere. A specific analysis of the effect of wind direction is presented for Gotha. Spectral differences in maximum polarization are indicated by the fact that with blue filters the highest sensitivity is at 465 mμ, with red filters at 630 mμ. The results of this experimental study are presented in graphs and tables. *Subject Headings:* **1. Maximum polarization 2. Polarization measurement equipment 3. Polarization-turbidity relationships.**—*I.L.D.*

10.1–347 551.593.7

Grzedzielski, Stanislas, **Remarques sur la polarisation dans le milieu H II.** [Remarks on the polarization in the H II milieu.] *Académie des Sciences, Paris, Comptes Rendus*, 246(6):

890–893, Feb. 10, 1958. 5 refs. **DLC**—It is demonstrated that, in the case of Davis-Greenstein's mechanism, it is probable that an important part of polarization is produced in the rarefied H II milieu. *Subject Heading:* **1. Polarization.**—*A.V.*

10.1–348 551.593.7

Nadzhakov, G. and Kashukeev, N. T., **Izmenenie poliarizatsiiata na fotoelektretite pod vliianie na temperatura.** [Changes of polarization of photoelectricity influenced by temperature.] *Bulgarska Akademiia na Naukite, Sofia, Izvestiia, Otdelenie za Fiziko-Matematicheski i Technicheski Nauki, Ser. Fizicheska*, 3:103–117, Jan./Dec. **1952.** 9 figs., 3 tables, 7 refs. Russian and German summaries p. 117. **DLC**—The method and results of an investigation of changes of photopolarization occurring in a photoelectric (monocrystalline sulfur) plate caused by changes of temperature are described and discussed. It has been established that the main causes of these changes are: 1) The decrease of polarization and the intensification of recombination between both opposite volume charges; 2) The intensification of diffusion of photopolarization charges in direction of the electrodes. Both these processes proceed very slowly and polarization remains practically unchanged or decreases very leisurely. *Subject Headings:* **1. Polarization 2. Temperature effects.**—*A.M.P.*

ELECTRICAL PHENOMENA

See also: **VLF radio wave propagation** (Chapman), 10.1–131; **Sferics from lightning, Slough, Eng.** (Horner, Clarke), 10.1–133; **Meteor ionization trails** (Montgomery, Sugar), 10.1–338.

10.1–349 551.594:551.510.42

Rouch, J., **Mesures de l'influence des fumées sur le champ électrique de l'atmosphère.** [Measurements of the influence of smoke on the atmospheric electric field.] *Académie des Sciences, Paris, Comptes Rendus*, 245(23):1987–1988, Dec. 4, **1957. DLC**—With a view to determine the influence of smoke on the atmospheric electric field, the author made measurements at Monte Carlo, in a place situated about 100 m from the shore and about 60 m from the railroad Monte Carlo-Menton. Observations are made before and after the passing of a train, and it is established that the field increases for several tens of volts when a train passes. Increase is rapid and can reach 200 V; sometimes it appears only 1 or 2 min after the passing of the train. This influence of smoke is generally attributed to a decrease in the atmospheric conductibility, owing to the reduction of the number of small ions. Is this explanation sufficient to ascertain the very high field changes which are observed, and should not rather the original charge of the smoke be influential? *Subject Headings:* **1. Atmospheric electric field 2. Influence of smoke 3. Monte Carlo, Monaco.**—*A.V.*

10.1–350 551.594.1/2:551.508.94:621.317

Dolezalek, H., **Electrometer-tube-amplifier in the atmospheric-electrical measuring technique.** Germany. Deutscher Wetterdienst (Aachen Met. Obs.), Contract AF 61(514)-940, Technical Note, No. 2, Jan. 1, **1956.** 27 p. 15 figs., 22 refs. **DWB** (M94 A111t)—After a short discussion of the amplifiers required for measurements in the field of atmospheric electricity, a description is given of the two basic types of power amplifiers operated with special electrometer tubes. The paper closes with a discussion of amplifiers with electrometer tubes used in the years 1954 to 1956 for synoptical atmospheric electrical and meteorological investigations in the Swiss Alps (cf. H. Israël, G. Fries and H. Dolezalek, 1956). *Subject Headings:* **1. Atmospheric electricity measurement techniques 2. Electrometers.**—*Author's abstract.*

10.1–351 621.396:551.594.12:551.590.25

Eshleman, V. R., **Some characteristics of radio communication via meteor ionization trails.** *IGARDograph*, Paris, No. 26:15–26, July **1957.** 2 figs. 2 tables, 15 refs. **DWB** (629.1322 I864a)—Since 1950, efforts have been made, especially in Canada, at Manchester and Stanford Univ., to use meteor ionization trails for radio propagation. Successful demonstration is credited to the group at the Radio Physics Lab. of the Canadian Defence under direction of

P. A. Forsyth since 1953. The question of bursts vs. continuous scatter propagation over the same path (to and from meteor trails) is discussed. Advantages of bursts at shorter wave lengths (6 to 3 or less meters) are discussed in terms of interference and availability of space, higher gain and movable antennas. Diurnal changes in meteor radiant distribution are discussed. Continuous radar monitoring of radiant distribution could provide instantaneous propagation predictions. *Subject Heading:* **1. Radio wave propagation by meteor ionization trails.**—*M.R.*

10.1–352 551.594.12:551.590.25

Manning, L. A. (*Radio Propagation Lab., Stanford Univ.*), **The initial radius of meteoric ionization trails.** *Journal of Geophysical Research*, Wash., D. C., 63(1):181–196, March **1958.** 6 figs., table, 4 refs., 27 eqs. **DLC**—The formation about the path of a meteor of regions of ionized and neutral atoms of meteoric material is investigated from the viewpoint of kinetic theory. It is found that the high initial velocity of the diffusing particles causes the trail to quickly reach an "initial radius" from which normal diffusion then proceeds. It is shown that the reflected signal may, for most purposes, be computed on the assumption that the trail reaches this initial radius instantaneously. The value of the initial radius is approximately 14 mean-free-paths; it is thus greater for the neutral than for the ionized trail. It is shown that at very high frequencies the initial radius may reduce the amplitude of the returned signal from under-dense trails by as much as 50 db. If heating is neglected, it is shown that the effect of initial radius on over-dense trails is marked at the same heights and frequencies as for under-dense trails. *Subject Heading:* **1. Meteor ionization trails.**—*Author's abstract.*

10.1–353 551.594.14 551.510.7

Institut Interuniversitaire des Sciences Nucléaires, **Protection contre les radiations: recommandations.** [Protection against radiation: recommendations.] Mons, Belgium, Etabl. Delporte, **1958.** 224 pages, tables. **DLC** (RA1231.R2I54)—This draft handbook groups, in a different form, the various recommendations concerning protection against radiation published by the National Bureau of Standards of the U. S., and the recommendations issued from the International Commission of Protection against radiation (*Journal d'Electrologie et de Radiologie*, **1956**). The biological action of radiation is in relationship with the ionization phenomena unlatched within the tissues. This work includes 7 chapters. The first chapter concerns general considerations; it gives the definitions of words and expressions, radiation sources, radiations noxiousness, dosing units, etc. The following chapters treat successively of safety devices against external radiation sources and against radioisotopes, of a special study of protection in some particular cases, of safety devices against neutrons, of precautionary measures for the supervoltage apparatus, and finally of the physical equipments for measurements and control concerned with protection. This handbook is aimed at giving to the researchers a survey of the risks they are running, and the precautions they should take. *Subject Headings:* **1. Atmospheric radioactivity 2. Protection against radiation.**—*A.V.*

10.1–354 551.594.223:551.510.41

Dauvillier, A., **Foudre globulaire et réactions thermonucléaires.** [Ball lightning and thermonuclear reactions.] *Académie des Sciences, Paris, Comptes Rendus*, 245(25):2155–2156, Dec. 16, **1957.** 1 ref. **DLC**—The author suggests that ball lightning, or "lightning remains," is formed of radiocarbon 14, owing to the action of thermic neutrons released within the lightning on atmospheric nitrogen. Should this hypothesis be correct, then this natural thermonuclear reaction may be the only possible one on a terrestrial planet, and radiocarbon, which marks every living being, should have a dual origin. It should be more abundant in the tropical regions than in the polar ones. *Subject Headings:* **1. Ball lightning 2. Atmospheric nitrogen.** —*A.V.*

10.1–355 551.594.221:621.316.98:550.372

Bricard, J. (*Inst. de Physique du Globe, Paris, France*), **Some remarks concerning the effectiveness of the lightning rod and the distribution of lightning currents in the earth.** *U. S. Air Force. Cambridge Research Center, Geophysical Research Papers*, No. 42:182–189, Nov.

1955. fig., table, 7 refs., 21 eqs. **DLC**—We calculate, at a given moment, the distribution of lightning currents in the neighborhood of the spot struck by the flash of lightning. One supposes that, during the partial discharge, the current, which flows from the Earth to the cloud, travels over a vertical rectilinear conductor, and has an intensity given by GOLDE's formula $I = M(e^{-mt} - e^{-nt})$; t being the time, and m and n two constants, respectively, equal to 4.4×10^4 and 4.6×10^5. We take, as a maximum intensity, $I_m = 25{,}000$ amp. It is assumed that the Earth is an homogeneous conductor, separated by a plane from the atmosphere. We take the atmosphere as an equally homogeneous dielectric. It is assumed that there is no hysteresis and that, owing to the relative small values of the charges, there is no chemical dissociation in the ground. We transform these conditions into MAXWELL's relations written in cylindrical coordinates, owing to the symmetry of the problem. In this case, one can see that the components I_ϕ of the current density and H_z and H_r of the magnetic field are zero. The relations may be simplified, and the displacement term $\epsilon\, dE/dt$ (ϵ represents the dielectric constant and E the electric field in the Earth) may be disregarded when compared to the conductivity term in consideration of the relatively high values of the electric conductivity of the ground ($\sigma = 10^9$ cgs). Using a particular integral and CARSON's method, we obtain equations for I_r, I_z, and H_ϕ. We draw the curves representing the variables in terms of z or r for values included between 10 and 10^4 cgs, and we study in particular the skin effect and the potential distribution under the Earth surface. The results are discussed and compared with experimental values. *Subject Headings:* **1. Lightning current distribution 2. Lightning rods.**—*Author's abstract.*

AURORAS

See also: **Auroral symposia, 10.1–1; Cosmic ray stations for IGY, Canada and U.S.S.R., 10.1–43; Fabry-Perot interferometer** (Armstrong), **10.1–238.**

10.1–356 551.594.5 537.534.74

Bates, D. R. and Dalgarno, A. (*Dept. of Applied Mathematics, Queen's Univ. Belfast*), **Inelastic collisions between heavy particles.** (In: **The airglow and the aurorae: a symposium.** London, Pergamon, **1956.** p. 328–336. 2 tables, 63 refs., 40 eqs.) **DWB**—Studies on heavy particle collisions, which have appeared since the reviews of MASSEY and BUPHOP and of ALLISON and WARSHAW, are briefly summarized. *Subject Heading:* **1. Auroral particles.**—*Authors' abstract.*

10.1–357 551.594.5:551.510.62:550.388.8

Bullough, K.; Davidson, T. W.; Kaiser, T. R. and Watkins, C. D., **Radio reflections from aurorae, Pt. 3, The association with geomagnetic phenomena.** *Journal of Atmospheric and Terrestrial Physics*, London, 11(3/4):237–254, **1957.** 15 figs., 2 tables, 15 refs. **DLC**—This paper presents a further study of the radio-echo observations of auroral ionization, made on a frequency of 72 Mc/s between June 1949 and Oct. 1953, described in a previous paper of this series (BULLOUGH and KAISER, 1955). The data are compared with geomagnetic observations made at Eskdalemuir during the same period. A good correlation is found between the daily frequency distribution of the radio echoes and the mean daily variation in magnetic disturbance. The change from a positive to negative bay type of disturbance tends to occur between 2100 and 2200 hr local time and coincides with a minimum in the frequency of echo occurrence. This minimum separates the diffuse echoes (from westward-moving ionization) of the evening sequence and the discrete echoes (from eastward-moving ionization) of the morning sequence. There exists a close correspondence between the occurrence of radio echoes and features in the magnetic disturbance. In a number of cases there appears to be a displacement in time between echo components and peaks in the magnetograms; it is suggested that this corresponds to the time of transit of the ionization between the reflecting region and the magnetic meridian through Eskdalemuir (some 10° in magnetic longitude to the west). The probability of occurrence of 72 Mc/s echoes during a positive disturbance is approximately double that for a negative one, being 50% for $\Delta H > 100\gamma$ and $\Delta H < -200\gamma$. The results and conclusions appear in several aspects to conflict with the CHAPMAN-FERRARO-MARTYN theory of magnetic storms and aurorae. *Subject Headings:* **1. Radio echoes from auroras 2. Auroral ionization 3. Auroral-magnetic relationships.**—*Authors' abstract.*

10.1–358 551.594.5

Dufay, M., **Le spectre d'une aurore de basse latitude dans le visible et le proche infrarouge.** [Spectrum of a low-latitude aurora in the visible and near infrared.] *Académie des Sciences, Paris, Comptes Rendus*, 245(19):1648–1650, Nov. 4, **1957.** 1 fig., 1 table, 5 refs. **DLC**—A low-latitude aurora observed on Sept. 29, 1957, at the Haute-Provence Observatory, has presented a spectrum very rich in atomic rays. In particular were disclosed the interdicted transitions $^1D-^1S$ of [N II], $^2D-^2P$ of [O II] and $^2D-^2P$ of [N I]. *Subject Headings:* **1. Auroral spectrum 2. Haute-Provence, France.**—*A. V.*

10.1–359 550.385:551.594.5

Kaiser, T. R., **Relationships between auroral ionization and magnetic disturbance.** *Annales de Géophysique*, Paris, 14(1):76–79, Jan./March **1958.** 3 figs., 7 refs. **DLC**—This report presents results from a detailed analysis of the correlation between characteristics of the auroral ionization and the geomagnetic disturbance. The magnetic disturbance is associated with spatially localized regions of intense ionization moving horizontally along a magnetic parallel of latitude. It suggests that, while the ionized clouds must preserve nearly electrical neutrality, there is a net drift of negative charge in the direction of motion of the ionization. This is from the dark to the sunlight hemisphere and is thus opposite to that predicted by MARTYN in his extension of the CHAPMAN-FERRARO corpuscular stream theory. It also appears that, for a given magnitude of magnetic disturbance, the ionization during positive bays is more intense than during negative ones. This supports the view that the morning maximum may become relatively less pronounced at higher radio-frequencies. *Subject Headings:* **1. Auroral ionization 2. Geomagnetic disturbances 3. Ionized clouds 4. Chapman-Ferraro theory.** —*A. V.*

SFERICS

See: **Sferics effects on radio communications** (George), 10.1–26; **Sferics** (Sullivan et al.), 10.1–27.

PART II. ANNOTATED BIBLIOGRAPHY ON SELECTED WORKS OF CHARLES ERNEST PELHAM BROOKS

By: *Marian K. Rigby and Malcolm Rigby*

INTRODUCTION

Since this is the 100th. in this series of monthly Selective Annotated Bibliographies begun in the January 1950 issue of Meteorological Abstracts and Bibliography, it seems fitting to dedicate it to the important and useful works of Charles Ernest Pelham Brooks, who did so much to make this series possible, not only by preparing several excellent bibliographies, (see 10A–173, –178, –179, –180, –182, –186, –191 and –193), but by taking up the slack in the workload for the production of Current Abstracts in order to make it possible for others on the MAB staff to take time to prepare the other bibliographies in the series, and finally by offering suggestions for inclusion or omission, by critical examination of the outlines, proofs, and classification numbers, and in many other ways.

By his own choice, scores of minor works, reviews, editorials, etc. have been omitted, thus leaving about 200 of his more enduring works for inclusion. The most important books and monographs have been placed at the first in chronological order, and then the monographs and articles, in chronological order, from 1914 to 1957, covering the wide range of subject matter shown in the following Subject Outline, and the wide range of geographical interest as shown in the Geographical Outline. The climatic studies of particular places are of enduring value because well analyzed and organized climatic data never deteriorates in value: it is always useful for comparisons in studying climatic changes. All of C. E. P. Brooks' climatological publications showed remarkable perspective and thoroughness in their organization. He was engaged in climatological research for 50 years and was the chief climatologist of the British Meteorological Service for several decades, and as such was in the enviable position of the organizer, the user and the performer of service to other users, not to mention bibliographer in that intricate branch of librarianship.

A note on his life appears in the dedication on p. iii of this issue. His own works, however, are the chief witness to a life well spent in the service of science, country, the world and humanity.

Acknowledgement is made of the assistance given by the National Science Foundation in the preparation of the bibliography, and to Dr. C. E. P. Brooks and Mrs. Dora M. Brooks who supplied many of the abstracts and made suggestions for additions and for elimination of trivial or ephemeral material, and in providing U.D.C. classification numbers to most of the items published. We wish also to express thanks to Miss Mary L. Rice for painstaking editing and checking of references.

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MAJOR WORKS

1922

10A–1 551.583.2

Brooks, C. E. P., **The evolution of climate.** London, Benn, **1922.** 173 p. 2nd ed., **1925. DWB** (M1702 B873). Reviewed in *Meteorological Magazine,* 60:119, June **1925.**—Mainly a description of the climatic changes of the Glacial, Post-glacial and Historical periods, in Northern and Central Europe, Mediterranean, Asia, North America, Central and South America, Africa, Australia and New Zealand, Antarctic. Attempts dating and correlation of different series. (*Same item as* G–27, July 1950, *MAB.*) *Subject Headings:* **1. Climatic changes 2. Glacial periods 3. Historical climates.**—*C.E.P.B.*

1926

10A–2 551.583.7(02)

†Brooks, C. E. P., **Climate through the ages: a study of the climatic factors and their variations.** London, Benn, **1926.** 439 p. 39 figs., tables, refs. at end of each ch. **DWB** (M8B873c 1926), **DLC** (QC884.B65)—Pt. I describes the climatic factors and their variations in geological time, including solar radiation and astronomical factors. The difference between "glacial" and "non-glacial" periods is emphasized. Pt. II, on geological climates and their causes, shows that the geographical theory of climatic change is quantitatively sufficient to explain the major oscillations. The continental drift theory is examined and objections brought out, a geographical theory of late Palaeozoic glaciation and various aspects of Quaternary climate are discussed. Pt. III takes up

the climate of the historical past, collects and analyzes a great deal of evidence about climatic changes since 5000 B.C., and discusses possible causes. (For abstract on revised edition published in 1949, *see* item 10A–8.) (*Same item as* G–32, July 1950 *MAB.*) *Subject Headings:* **1. Paleoclimatology 2. Postglacial climates.**—*C.E.P.B.*

1927

10A–3 551.5(023)

Brooks, C. E. P., **The weather; an introduction to climatology.** London, Ernest Benn, **1927.** 79 p. 3 figs., 15 refs. (Benn's Sixpenny Library, No. 145.) **DWB** (M B873wa), **DLC** (QC863.B875 1933)—A popular text. Ch. 1, The sun and the atmosphere; Ch. 2, The way of the winds; Ch. 3, The conditions in the upper air; Ch. 4, Cyclones and anticyclones; Ch. 5, Climatic zones; Ch. 6, The climates of the continents; Ch. 7, Local modifications of climate. *Subject Headings:* **1. Popular meteorology 2. Climatology.**—*C.E.P.B.*

1928

10A–4 551.577.37(410) 551.577.38(410) 551.577.33(410)

Brooks, C. E. P. and Glasspoole, J., **British floods and droughts.** With an introductory note by Hugh Robert Mill. London, Benn, **1928.** 199 p. 15 figs., tables. **DWB** (M77.6 B873b), **DA** (340 B79b)—Pt. I deals with **Great rains and floods**—the causes of persistent rain; the wet year 1927; the wet summer of 1924; 1903, the year with two wet spells; the rainy seasons of the 'seventies, historic rains, and the Thames flood of 1928 and other floods. Pt. II, **Droughts,** deals with the causes of drought, the drought of 1921, the dry year 1887, dry years of the eighteenth century, and historic droughts of the Middle Ages. Finally, Pt. III, **Variations of rainfall,** covers extremes of rainfall and cycles of weather. *Subject Headings:* **1. Extremes of rainfall 2. Historic droughts 3. Rainfall periodicities 4. British Isles.**—*C.E.P.B.*

1929

10A–5 551.58(02)

Brooks, C. E. P., **Climate; a handbook for business men, students and travelers.** London, Benn, **1929.** 2nd ed. rev., **1932.** 199 p. 3 figs., tables, refs. **DLC** (QC981.B8), **DWB** (M1700 B873c)—After an introductory chapter, the climates of the world are described on a zonal bases—the North Temperate, Mediterranean, North Tropical, Equatorial Subtropical and Temperate climates of the Southern Hemisphere, and Polar regions (Arctic, Greenland, Antarctic). Each section is followed by a set of tables giving: monthly mean temperature, monthly rainfall, temperature range and extremes, and for Jan. and July relative humidity and cloudiness, and annual number of days of rain, snow and thunder. A bibliography follows each section. *Subject Heading:* **1. Climatology textbooks.**—*C.E.P.B.*

1932

10A–6 551.582:551.583(53,62,661)

Brooks, C. E. P., **Le climat du Sahara et de l'Arabie.** [The climate of the Sahara and of Arabia.] Introduction by Masauji Hachisuka, p. 1–23. Paris, Société d'Editions Géographiques, Maritimes et Coloniales, **1932.** 81 p. 17 figs., 11 tables, refs. **NNA, DWB** (c/fc B873)—Desert climates are discussed in general, followed by detailed treatment of the deserts of the Sahara and the Arabian Peninsula. Barometric pressure and winds are taken up with figures showing mean isobars and predominant wind directions for different months. Storm phenomena are discussed: direction, duration, month of occurrence, etc. A chapter takes up rain, clouds and fair weather: relative amounts, comparisons between the regions, etc. Another treats of distribution of temperature, giving annual means, extremes, etc. Humidity, dew, visibility and mirage are discussed. Geologic changes of climate and changes in historic times are noted. Emphasis seems to be on African region, although there is ample material included regarding Arabia. (*Same item as* 2F–96, June 1951 and 2J–137, Oct. 1951, *MAB.*) *Subject Headings:* **1. Climatology 2. Climatic changes 3. Sahara 4. Egypt 5. Arabia.**—*H. P. Kramer.*

1939

10A–7 551.5:016

†Brooks, C. E. P. (*comp.*), **A selected bibliography of meteorological literature, 1901–1935.** *Great Britain. Meteorological Office, M.O.M.*, No.358, March **1939.** 151 p. Mimeo. **DWB**—This bibliography includes about 1500 unannotated references to meteorological literature published during 1901–1935 and regarded as of considerable permanent importance or as classics. They are classified according to section 551.5 of the U.D.C. classification adopted in 1936. Some references to terrestrial magnetism and other subjects related to meteorology are added. (*Same item as* 6A–139, Jan. 1955, *MAB.*) *Subject Headings:* **1. Meteorology bibliographies 2. Bibliography on meteorology 3. U.D.C. bibliographies.**—*C.E.P.B.*

1949

10A–8 551.583(02)

†Brooks, C. E. P., **Climate through the ages; a study of the climatic factors and their variations.** New York, Toronto, McGraw-Hill, **1949.** 2nd ed., completely rev. 395 p. 39 figs., 31 tables, refs. at end of chs. 2 append. **DLC** (QC884.B65 1949)—The first ed. published in **1926** (*see* 10A–2) reviewed the latest theories on climatic changes and expressed the conclusions of the author after 20 years of intensive study in this field. During the two subsequent decades much additional evidence for or against these theories accumulated allowing a revision which expressed a more mature judgment in this rapidly changing field of research. Critical examination of much of the data taken from literature and chronicles led to their being rejected and deleted from this edition. The book is arranged in the same general order as the first ed.: Pt. I discusses the climatic elements and their variation, pressure and winds, oceanic circulation, solar radiation, cloudiness, continentality, temp., precip., effect of glaciers or lack of glaciers on climate; effect of mountain building, and astronomical factors on glaciation and deglaciation. Pt. II reviews geological climates and their causes, including the theory of continental drift. Pt. III takes up the more plausible evidence of climatic fluctuations in the historical past, with citations from recent literature on the subject, and treated from the evidence for each continent: Europe, Asia, Africa, America and Greenland. The appendix contains a selective bibliography on various theories of climatic change such as: 1) Cosmical changes, 2) solar radiation, 3) astronomical theories, 4) geothermal, 5) polar movement or crustal drift, 6) elevation, 7) land-sea distribution, 8) ocean currents, 9) changes in atmospheric composition, 10) volcanic dust and 11) changes in atmospheric circulation. The statistical value of tree-ring, pollen, varve and other methods of geochronology, and the significance of changes in Arctic ice are brought into perspective. (*Same item as* 3–121, March 1950 *MAB.*) (For translation into Russian, *see* 10A–11.) *Subject Headings:* **1. Climatic variations 2. Paleoclimatology 3. Historical climates 4. Climatic change theories.**—*M.R.*

1950

10A–9 551.58:612:628.8:620.19(02)

†Brooks, C. E. P., **Climate in everyday life.** London, Benn, **1950.** 314 p. 34 figs., 26 tables, 3 append. (tables), 155 refs. **DWB, DLC** (GF71.B7)—A book planned to provide the practical information most often required about climate. Pt. 1, **Living with the climate,** discusses the various types of climate and their effect on human efficiency, comfort and health. World charts are given for mean air and wet-bulb temperatures, Jan. and July. Subjects discussed include water-, wind-, and sun-power, water supply and transport, including hindrance by snow cover and sea ice. Ch. 2 discusses siting and design of houses and factories in relation to climate (with table of sunshine at 107 places), lighting, purity of air, local climates and wind structure. In Chs. 3–7 the peculiarities of different climates are set out from the human point of view. Pt. II, **Climate as an enemy,** discusses climate and the deterioration of materials, including extreme temperatures in the sun and effect of temperature and humidity on corrosion and moulding; atmospheric pollution; and climatic "accidents"—heavy rain, floods, hail, snow, ice storms, lightning, tornadoes, squalls, hurricanes and typhoons. Pt. III, **Control of climate,** includes heating, air conditioning, lighting, clothing, rain-making and fog dispersal, prevention of hail, protection from lightning, frost prevention and windbreaks. Appendix I gives climatic statistics and "thumb-nail" sketches for over 270 places in all parts of the world. (*Same item as* 2.1–149, Jan. 1951 and 5J–18, 1954 *MAB.*) *Subject Headings:* **1. Climatology 2. Architecture 3. Industrial climatology.**—*C.E.P.B.*

10A–10 551.501.7:551.557.36 551.587

Brooks, C. E. P.; Durst, Charles S.; Carruthers, N.; Dewar, D. and Sawyer, J. S., **Upper winds over the world.** *Great Britain. Meteorological Office, Geophysical Memoirs,* No. 85, **1950.** 149 p. 33 tables, 19 figs., 60 charts, 74 refs., 4 appends. **DWB**—This is one of the most widely used publications in meteorology in spite of its preliminary nature and the paucity of data in some parts of the globe. The first part gives details of methodology in constructing wind roses (for wind direction and speed frequencies) at any height up to 40,000 ft wherever the vector mean wind and standard vector deviation can be determined (using the assumption that upper air winds are normally distributed). World charts of 700, 500, 300, 200 and 130 mb topography are presented for each season in Pt. II. In Pt. III charts of mean standard vector deviation are given for the same levels and seasons, using the hypothesis that the product of the vector standard deviation and the air density is in most cases constant for any one place or season up to the tropopause. Methods of extrapolation are explained. Pt. IV gives seasonal charts of stream lines and mean vector speed in tropics up to 200 mb. Similar world charts for upper air temperatures were being planned and their execution was carried out after the retirement of C. E. P. Brooks, publication being realized in late 1958. (*Same item as* 4E–186, May 1953, and 10–117, Oct. 1950, *MAB.*) *Subject Headings:* **1. Statistical techniques 2. Upper air wind roses 3. Upper air wind frequencies.**—*G. J. Evans and M.R.*

1952

10A–11 551.583(02)

Brooks, C. E. P., **Klimaty proshlogo.** [Climate through the ages.] Trans. by V. G. Levinson; ed. by B. P. Alisov and V. I. Gromov. Moscow, **1952.** 356 p. 39 figs., 29 tables, refs. **DLC** (QC884.B6516)—A complete and only slightly abridged translation into Russian of the second (1949) edition of C. E. P. Brooks' famous book on the climate of the geological and historical past (*see item* 3–121, March 1950, *MAB*). A 4-page introduction by one of the editors, similar to a review which appeared in **Vsesoiuznoe Geograficheskoe Obshchestvo, Izvestiia,** credits Brooks' work with presenting a completely critical survey of the various theories of climatic change, and with containing much interesting material for astronomers, geographers, geologists and climatologists, and in spite of many obvious deficiencies which are enumerated (mainly ignorance of most recent Russian works) it is said to be "not as bad as most capitalist treatises." Certain portions dealing with the heretical ideas of Huntington and his school have been expurgated as being anti-Marxist, but on the whole the translation is faithful and accurate, and presented in a high quality edition, with good reproduction of charts and diagrams, and few typographical errors. (*Same item as* 4.11–246, Nov. 1953, *MAB.*) *Subject Headings:* **1. Paleoclimatology 2. Post glacial climates 3. Translations. I. Levinson, V. G.** (*trans.*) **II. Alisov, B. P.** (*ed.*) **III. Gromov, V. I.** (*ed.*).—*M.R.*

1953

10A–12 551.5:519.2

†Brooks, C. E. P. and Carruthers, Nellie, **Handbook of statistical methods in meteorology.** London, H. M. Stationary Office, **1953.** 413 p. 75 figs., tables, refs., eqs. M.O. 538. **DWB, DLC** (QA276.B73). Review by R. Sneyers in *Ciel et Terre*, 69(9/10):255–259, Sept./Oct. **1953.** refs. **DLC**—This book sets out formulas, methods and examples of the application of modern statistical ideas to meteorological data. Pt. I, **The distribution of observations,** deals with "observations" as individual phenomena, their nature and errors, probability, one-dimensional frequency distributions, mean values, standard deviation, skewness, kurtosis, and significance tests. The properties of various types of distribution—binomial, normal, Pearson curves, etc.—are summarized. A chapter is included on the analysis of variance. Pt. II, **Related variables,** discusses space distributions, vector quantities, correlation, smoothing, interpolation and curve fitting. Pt. III, **Time series,** includes persistence, harmonic analysis, and examination of various methods of periodogram analysis. Appendices give useful statistical formulas and tables. Nearly all the examples and exercises are taken from meteorology. (*Same item as* 4.6–2, June 1953, *MAB.*) *Subject Headings:* **1. Statistical analysis. I. Great Britain. Meteorological Office.**—*C.E.P.B.*

1954

10A–13 551,58(410)

Brooks, C. E. P., **The English climate.** With a foreword by Sir David Brunt. London, English Universities Press, **1954.** 214 p. 27 figs., 6 tables, refs. **DWB, DLC** (QC989.G69B73)—This book describes in simple terms the climate and weather of Britain as they affect the "man in the street." Ch. 1–3 describe briefly the physical basis of British climate including the Gulf Stream, the prevailing winds and air masses, the structure of depressions with some historical examples including the storm of 1703, squalls and tornadoes. Ch. 4 deals with rain, snow and hail, with a chart of "raininess" (rainfall × no. of raindays). Ch. 5 is concerned mainly with the effects of atmospheric pollution, illustrated by a chart of "dirtiness" of London air. The next three chapters take up problems of local climate, climate and health, and "where to live, where to holiday." Ch. 9–13 discuss seasonal changes, "singularities" and historic extremes of weather, and Ch. 14 weather cycles and other prognostics. The final chapter gives an explanation of daily weather maps televised charts and the Automobile Association's "Road weather chart." (*Same item as* 5.11–1, Nov. 1954, *MAB.*) *Subject Headings:* **1. Climatology 2. Microclimatology 3. Bioclimatology 4. Great Britain. I. Brunt, Sir David.**—*C.E.P.B.*

SHORTER ARTICLES AND MONOGRAPHS

1914

10A–14 551.583.3:551.515.7

Brooks, C. E. P., **The meteorological conditions of an ice-sheet and their bearing on the desiccation of the globe.** *Royal Meteorological Society, Quarterly Journal*, 40(169):53–70, Jan. **1914. DWB**—The following subjects are discussed: the meteorological conditions over existing ice-sheets, precipitation in a glacial anticyclone, the great ice age, the pluvial period, the cause of a pluvial

period, the desiccation of the globe, followed by a summary. *Subject Headings:* **1. Ice ages 2. Glacial anticyclones.**—*M.K.R.*

1916

10A–15 551.506.3(09)(411)

Brooks, C. E. P., **Notes on an old M.S. weather diary of the Perth Literary and Antiquarian Society.** *Royal Meteorological Society, Quarterly Journal*, 42(178):51–55, Jan. **1916.** Also: **Note on an old weather record found amongst the M.SS. of the Antiquarian Museum.** Source unknown. 8 p. 1 fig., 2 tables. **DWB**—The data cover the years 1754–74, presumably made at Perth. Pressure readings are compared with those for Edinburgh, 1769–74, and corrections made. Two tables have been constructed, I. Mean temperature, Perth, 1754–74. II. Mean temperature at noon, Perth, 1758–74. Mean and extreme temperatures at Perth. The author concludes that, although the records are only partially comparable with present day records, when combined and compared with other old records constantly being located, they will help in obtaining the meteorological history of the 18th century. *Subject Headings:* **1. Historic weather records 2. Perth, Scotland.**—*M.K.R.*

10A–16 551.577.2(669,667)

Brooks, C. E. P., **The rainfall of Nigeria and the Gold Coast.** *Royal Meteorological Society, Quarterly Journal*, 42(178):85–106, April **1916.** 5 figs., 5 tables, refs. **DWB**—Using data from different stations of the two countries for varying periods prior to 1913, the author discusses the general precipitation conditions of the several regions, computes monthly and annual rainfall statistics and constructs isohyets. (*Same item as* 3H–26, Aug. 1952, *MAB.*) *Subject Headings:* **1. Precipitation 2. Nigeria 3. Gold Coast.**—*H. P. Kramer.*

1917

10A–17 551.588.1:551.583.3

Brooks, C. E. P., **Continentality and temperature.** *Royal Meteorological Society, Quarterly Journal*, 43(182):159–173, April **1917.** 4 figs., 6 tables. **DWB**—An attempt to apply methods of partial correlation to the problem of the power of geographical conditions to modify the temperature-effect of the sun's heat. Area considered: Eurasia between lat. 40° and 60°N and from Atlantic coast and islands eastward to 90°E long. 56 stations were selected, with their co-ordinates, height, continentality and the radiation received. Method used was to calculate for each station the percentage of land in a 5-degree circle, C^5; a 10 degree circle, C^{10}; and a 20 degree circle, C^{20}, with the station as center in each case. 6 tables and 4 maps are given. Discussion indicates that Dr. Brooks awakened new interest in the problem of the causes of the Ice Age, by bringing in climatological principles to aid in settling this geological problem. *Subject Headings:* **1. Continentality 2. Climatic changes.**—*M.K.R.*

10A–18 551.583.3

Brooks, C. E. P., **The correlation of the quaternary deposits of the British Isles with those of the continent of Europe.** *Smithsonian Institution, Washington, D. C., Report*, p. 277–375, **1917. DLC**—An early attempt at a cross-correlation of glacial and interglacial deposits on the basis of synchronism of climatic changes over wide areas. Now obsolete. (*Same item as* G–73, July 1950, *MAB.*) *Subject Headings:* **1. Climatic changes 2. Quaternary climates 3. Great Britain 4. Europe.**—*C.E.P.B.*

10A–19 551.506.3(51)

Brooks, C. E. P., **A meteorologist in China, 1902–1915.** *Royal Meteorological Society, Quarterly Journal*, 43(181):1–14, Jan. **1917.** 3 figs., 2 tables. **DWB**—Honors work of Capt. Lewis H. Tamplin, who died Dec. 1915. An exceedingly accurate observer with a fully equipped land station at Wuhu on the Yangtse April 1902–Jan. 1905, at Chinkiang on Yangtse 1905–12, at Amoy July 1914–Dec. 1915. Describes life of a meteorologist among Chinese of that time, giving some of ancient Chinese superstitious explanations of weather, and their fatalistic attitude which prevented any possible alleviation of flood and drought damage. Brief account of general conditions of area. 1 chart of Wind Roses, 6 pages of tables. *Subject Headings:* **1. Meteorological observations 2. China. I. Tamplin, Lewis H.**—*M.K.R.*

10A–20 551.501.42:551.524.2(6)

Brooks, C. E. P., **The reduction of temperature observations to mean of 24 hours, and the elucidation of the diurnal variation in the continent of Africa.** *Royal Meteorological Society, Quarterly Journal*, 43(184):375–388, Oct. **1917.** 6 figs., 7 tables, 16 eqs. **DWB**—The following subjects are considered: The constants of the diurnal variation (2 tables, 6 maps), The reduction of eye observations taken two or three times a day. (1 table), The direct reduction of $\frac{1}{2}(n+m)$ (1 table

with list of corrections). It was necessary to make the most of a small amount of material. *Subject Headings:* **1. Reduction methods 2. Temperature reduction 3. Africa.**—*M.K.R.*

1918

10A–21 551.588.1:551.524.2:551.583

Brooks, C. E. P., **Continentality and temperature, Pt. 2, The effect of latitude on the influence of continentality on temperature.** *Royal Meteorological Society, Quarterly Journal*, 44(188):253–270, Oct. **1918.** 6 figs., 10 tables. **DWB**—Continuing study of 1917, tracing variation with latitude. 1. The calculation of the equations connecting temperature with land distribution. 2. The geographical meaning of the regression equations. 3. The influence of the distribution of insolation. 4. Application to the theory of glacial periods. 5. The period of stability and the break-up of the ice sheets. 6. Conclusion: Climates of the world are the result of geographical conditions. Within certain limits, climatic and geographic conditions react one on another to produce continuous though very slow changes in both. (For abstract on Pt. 1, *see* 10A–17.) *Subject Headings:* **1. Continentality 2. Temperature 3. Climatic change.**—*M.K.R.*

10A–22 551.575.5(421)

Brooks, C. E. P., **Incidence of fog in London on January 31st, 1918.** *Great Britain. Meteorological Office, Professional Notes*, 1(3):21–30, **1918.** 2 figs., tables. **DWB**—Article covers: 1. Development of the fog; 2. The afternoon and evening of Jan. 31st; 3. Pressure, wind and temperature; 4. Dispersal of the fog; 5. Information supplied by M. O. staff. Two figs. and several tables are given. *Subject Headings:* **1. Fog 2. London, Eng.**—*M.K.R.*

10A–23 551.582.2(728.2)

Brooks, C. E. P., **The meteorology of Belize, British Honduras, 1888–1917.** *Royal Meteorological Society, Quarterly Journal*, 44(188):303–306, Oct. **1918. DWB**—In general Belize is healthy, except after heavy rains. Table I. Averages and extremes at St. Joseph's Observatory, 1888–1900. Pressure, temperature, relative humidity, cloudiness, wind, rainfall. Table II. Averages and extremes at Belize Public Hospital, 1894–1917. Table III. Monthly mean temperature at Public Hospital, 1894–1905. Table IV. Monthly rainfall in inches at Public Hospital, 1894–1917. *Subject Headings:* **1. Local climates 2. British Honduras.**—*M.K.R.*

10A–24 551.582.2(968.1)

Brooks, C. E. P., **The meteorology of Ocean Island during the period 1905–16.** *Royal Meteorological Society, Quarterly Journal*, 44(185):51–53, Jan. **1918.** 4 tables. **DWB**—Data for Ocean Island (0°52′S, 169°36′E), 1905–1916, are summarized by months and also year by year, based on observations made at 9 a.m. and 9 p.m. local time. Diurnal variations of pressure tabulated giving values for each 2 hours of the 24, for the two seasons Dec.–May and June–Nov. 1911. A semidiurnal pressure wave is evident, which differs only slightly in time and amplitude from the rainy to the dry period of the year. Data on relative humidity, cloudiness and wind direction to 8 points are included. Most of the rain falls in the months Dec.–April, though the driest month, August, has a 2.7 in. average and is extremely variable (0.6 to 8.5 in.). Annual totals range from 15 to 155 in. (1916 and 1914). (*Same item as* 4I–20, Sept. 1953, *MAB.*) *Subject Headings:* **1. Climate, Ocean Island 2. Ocean Island, Central Equatorial Pacific.**—*M.R.*

10A–25 551.582.2(95)

Brooks, C. E. P., **The meteorology of Port Moresby, British New Guinea, 1891 to 1916.** *Royal Meteorological Society, Quarterly Journal*, 44:217–220, July **1918. DWB**—Climate unfavorable to Europeans, because of damp moist heat. Table I. Averages and extremes; Table II. Monthly means of pressure; Table III. Monthly means of mean temperature; Table IV. Monthly totals of rainfall in inches. *Subject Headings:* **1. Local climates 2. Port Moresby, Papua.**—*M.K.R.*

10A–26 551.582.2(676)

Brooks, C. E. P., **The meteorology of Zomba, Nyasaland, 1892–1916.** *Royal Meteorological Society, Quarterly Journal*, 44(186):133–136, April **1918. DWB**—Brief general description of Nyasaland. Table I. Averages and extremes—Pressure, Temperature; Table II. Monthly means of pressure (24 hours); Table III. Monthly means of True Mean Temperature in F°; and Table IV. Monthly totals of rainfall in inches. *Subject Headings:* **1. Local climatology 2. Zomba, Nyasaland.** —*M.K.R.*

1919

10A–27 551.524.2(6)

Brooks, C. E. P., **Charts of mean temperature in Africa.** *Royal Meteorological Society, Quarterly Journal*, 45(191):251–252, July **1919. DWB**—Four charts are given and discussed: I. January—

summer in south; II. April (equinox)—sun vertical; III. July, summer in north; IV. Year—shows uniformity of warmth in interior. *Subject Headings:* **1. Temperature distribution 2. Africa.**—*M.K.R.*

10A–28 551.582.2(719)

Brooks, C. E. P., **The meteorology of Hebron, Labrador, 1883 to 1912.** *Royal Meteorological Society, Quarterly Journal*, 45(190):163–167, April **1919. DWB**—Labrador, generally regarded as a "land of awful desolation," is actually not as bad as gold fields of Alaska. Interesting because of lying in track of many barometric minima. 3 tables are given: I. Monthly averages and extremes. II. Monthly values of mean pressure. III. Monthly values of mean temperature. *Subject Headings:* **1. Local climatology 2. Hebron, Labrador.**—*M.K.R.*

10A–29 551.506.2(51)

Brooks, C. E. P., **Notes on a meteorological journal at Wei Hai Wei kept by Commander A. E. House, 1910–1916.** *Royal Meteorological Society, Quarterly Journal*, 45(189):29–41, Jan. **1919.** 3 figs. **DWB**—Climate healthy for white men at all seasons. Winter is cold but dry, with plenty of sunshine. In summer, heat is tempered by rains. 8 tables of careful records are summarized and discussed. *Subject Headings:* **1. Meteorological observations 2. Wei Hai Wei, China. I. House, A. E.**—*M.K.R.*

10A–30 551.577.2(689)

Brooks, C. E. P., **Rainfall of Nyasaland, Africa, 1882–1915.** *Royal Meteorological Society, Quarterly Journal*, 45(189):64–68. Jan. **1919. DWB**—Climatological year is divided into wet and dry seasons, which vary in the area north of lat. 7° and in the mountainous area. A 3 page table of rainfall data in inches and 3 figures or maps are included. *Subject Headings:* **1. Rainfall distribution 2. Nyasaland.**—*M.K.R.*

10A–31 551.577.34

Brooks, C. E. P., **The secular variation of rainfall.** *Royal Meteorological Society, Quarterly Journal*, 45(191):233–248, July **1919.** 3 figs., 3 tables. Discussion p. 246–248. **DLC**—A study of correlation of annual rainfall at 162 stations with "time." There is a large area of positive coefficients over Eurasia, positive areas over eastern South America, southwest Australia, Eastern Canada to Iceland, and Central Africa. Negative correlations are found in West Africa, South Africa and southern Asia. (*Same item as* G–185, July 1950, *MAB.*) *Subject Headings:* **1. Rainfall trends 2. Climatic variations 3. Historical climates.**—*C.E.P.B.*

1920

10A–32 551.582.2(829.1,99)

*Brooks, C. E. P., **The climate and weather of the Falkland Islands and South Georgia.** *Great Britain. Meteorological Office, Geophysical Memoirs*, 2(15):95–146, **1920. DWB** (551.05 G 796g v. 2 no. 15), **DLC**—1. General characters—Falkland Islands, South Georgia—physical conditions—Figs. 1–3; 2. Pressure—4 tables, Figs. 4–7; 3. Temperature—Tables V–XI, 4. Relative humidity—Table XII, Figs. 8–11; 5. Cloudiness—Tables XIII–XIV; 6. Sunshine—Table XV, Fig. 12; 7. Precipitation—Tables XVI–XVIII, Fig. 13; 8. Fog—Tables XIX–XXI; 9. Winds—Tables XXII–XXVI, Figs. 14–15; 10. Wind rose data—Tables XXVII–XXVIII, Fig. 16; and 11. Depressions—Fig. 17. Appendices I–IX. 30 pages of data, various periods. *Subject Headings:* **1. Local climatology 2. Falkland Islands 3. South Georgia.**—*M.K.R.*

10A–33 551.582(96)

Brooks, C. E. P., **The climate of the Fiji-Islands.** *Royal Meteorological Society, Quarterly Journal*, 46(193):96–100, Jan. **1920.** figs., 2 tables. **DWB**—Brief descriptive account of weather and seasonal variations on the Fiji Islands precedes a map showing average distribution of pressure and rainfall and prevailing winds at Suva (18°8′S, 178°26′E). the capital. Monthly meteorological data for Suva, temperature and humidity at Levuka and Nasinu and rainfall at various stations tabulated. (*Same item as* 4I–24, Sept. 1953, *MAB.*) *Subject Headings:* **1. Climate of Fiji Islands 2. Climatic data 3. Fiji Islands, Southwest Pacific.**—*H. P. Kramer.*

10A–34 551.582:633.51

Brooks, C. E. P., **Climates of the British Empire suitable for the cultivation of cotton.** *Meteorological Magazine*, London, 55(651):37–39, April **1920. DWB**—Essential features of a cotton-growing climate are listed, then the following British possessions are listed as favorable: Uganda, Nyasaland, Gambia, the Sudan, Nigeria, Gold Coast, Rhodesia, British East Africa, east coast of British South Africa, West Australia. *Subject Headings:* **1. Cotton climates 2. British Empire.**—*M.K.R.*

10A–35 551.571.2(669)

Brooks, C. E. P., **The distribution of relative humidity over Nigeria.** *Royal Meteorological Society, Quarterly Journal,* 46(195):289–292, July **1920.** fig., table. **DWB**—Table gives monthly mean values of relative humidity at 9 a.m. at various stations of Nigeria computed from Nigeria Gazette and Blue Book data for varying periods. Seasonal and annual isolines are charted along with explanation and discussion in text. (*Same item as* 3H–31, Aug. 1952, *MAB.*) *Subject Headings:* **1. Relative humidity 2. Nigeria.**—*H. P. Kramer.*

10A–36 551.524.2(669)

Brooks, C. E. P., **The distribution of temperature over Nigeria.** *Royal Meteorological Society, Quarterly Journal,* 46(194):204–214, April **1920.** 8 figs., 2 tables. **DWB**—Author deals with mean monthly temperature distribution, using data from official sources for numerous stations during varying periods. Isotherms are drawn and mean daily maximum, minimum and mean temperatures are tabulated for months and year. (*Same item as* 3H–32, Aug. 1952, *MAB.*) *Subject Headings:* **1. Temperature distribution 2. Nigeria.**—*H. P. Kramer.*

10A–37 551.582.2(617)

Brooks, C. E. P., **The meteorology of British Somaliland.** *Royal Meteorological Society, Quarterly Journal,* 46(196):434–438, Oct. **1920.** 4 tables. **DWB**—Short discussion and summarized tables are given of 12 years observations at Berbera along with some fragmentary data for Sheikh in the interior. (*Same item as* 2J–89, Oct. 1951, *MAB.*) *Subject Headings:* **1. Local climates 2. Berbera, British Somaliland 3. Sheikh, British Somaliland.**—*H. P. Kramer.*

1921

10A–38 551.555.1:551.577.3

Brooks, C. E. P. and Braby, H. W., **The clash of the trades in the Pacific.** *Royal Meteorological Society, Quarterly Journal,* 47(197):1–14, Jan. **1921.** 8 figs., 3 tables. Discussion p. 12–14. **DWB**—Pressures and winds are plotted for region 140°E to 150°W, 20°N to 20°S, for Jan. to June and July to Dec., for ocean squares and island stations. Rainfall varies with wind directions, and this is attributed to the southeast trade rising over the northeast, with a zone of eddy motion between them. (*Same item as* 4I–26, Sept. 1953, *MAB.*) *Subject Headings:* **1. Trade wind models 2. Rainfall variations 3. Winds at sea 4. Equatorial Pacific.**—*C.E.P.B.*

10A–39 551.509.33:551.577.38(4)

Brooks, C. E. P., **Could the drought of 1921 have been forecasted?** *Meteorological Magazine,* London, 56(668):211–215, **1921.** **DWB**—A study of the pressure distribution Feb.–June 1921 and comparison with 1911 suggest that preceding pressures and temperatures in the Arctic could have given a clue. (*Same item as* 2B–24, Feb. 1951, *MAB.*) *Subject Headings:* **1. Long range forecasting 2. Analogs 3. Drought 4. Europe.**—*C.E.P.B.*

10A–40 551.583.3

Brooks, C. E. P., **The evolution of climate in north-west Europe.** *Royal Meteorological Society, Quarterly Journal,* 47(199):173–194, July **1921.** 10 figs., footnote refs. **DWB**—Describes the climate during the following periods: 1. The last great glaciation, 2. The retreat of the glaciers, 3. The continental phase, 4. The maritime phase, 5. The later forest phase, 6. The peat-bog phase, 7. PETTERSSON's theory of cosmic causes of variation, 8. The recent phase, 9. Corresponding changes in North America. Followed by discussion by H. JEFFREYS, G. C. SIMPSON, J. L. MYRES, SIR NAPIER SHAW and C. E. P. BROOKS. Others not quite ready to agree with DR. BROOKS's theories, but felt that paper and work done were extremely valuable. *Subject Heading:* **1. Postglacial climates.**—*M.K.R.*

10A–41 551.582.2(64)

*Brooks, C. E. P., **Meteorological observations at Cape Spartel, Morocco, 1893–1920.** *Royal Meteorological Society, Quarterly Journal,* 47(198):141–145, April **1921.** 6 tables. **DWB**—A valuable series of meteorological observations is summarized in tables. One table gives a summary for the whole period based on observations at 9h and 21h; the second, monthly means of pressure; the third, corresponding values of temperature; the fourth, monthly rainfall totals; the fifth and sixth, diurnal variations of relative humidity, cloudiness and wind as shown by observations at three separate hours. (*Same item as* 3A–62, Jan. 1952, *MAB.*) *Subject Headings:* **1. Climatic data 2. Cape Spartel, Morocco.**—*H. P. Kramer.*

10A–42 551.582.2(911)

Brooks, C. E. P., **The meteorology of British North Borneo.** *Royal Meteorological Society, Quarterly Journal,* 47(200):294–297, Oct. **1921.** fig., 2 tables, ref. **DWB**—Brief summary of the

climate of British North Borneo is made. Observations kept since 1889 and published more or less regularly in the **British North Borneo Herald** are briefly summarized. One table gives temperatures for three stations with humidity and cloudiness for Sandakan; another gives rainfall at all stations for period ending in 1920. Meteorological returns for area were published in British North Borneo Herald up to 1935. (*Same item as* 5B–62, Feb. 1954, *MAB.*) *Subject Headings:* **1. Local climates 2. British North Borneo.**—*H. P. Kramer, K. Martinoff.*

10A–43 551.582.2(729.6)

Brooks, C. E. P., **The meteorology of Nassau, Bahamas, 1852–1919.** *Royal Meteorological Society, Quarterly Journal,* 47(197):59–62, Jan. **1921.** Brief summary or description, as deduced from tables of monthly averages and extremes of temperature and of rainfall at Nassau, from 1852–1919. Also a third table showing diurnal variation of wind from 1857–61. *Subject Headings:* **1. Local climates 2. Nassau, Bahamas.**—*M.K.R.*

10A–44 551.552(669) 551.576.2(669)

Brooks, C. E. P., **Nigeria: winds and weather; cloudiness.** *Royal Meteorological Society, Quarterly Journal,* 47(199):203–206, July **1921. DWB**—Nigerian weather governed by two main factors: Sahara to the north, readily cooled in winter, warmed in summer; Gulf of Guinea to the south, uniformly warm. The following tables presented and discussed: I. Wind direction and constancy, 1898–1919 (dates vary with stations); II. Calms, tornado, harmattan, thunder, fog or mist, 1907–1920; III. Mean cloudiness, 1889–1914 (varies for stations). *Subject Headings:* **1. Wind distribution 2. Weather 3. Cloudiness 4. Nigeria.**—*M.K.R.*

10A–45 551.577.2(729.1)

Brooks, C. E. P., **Rainfall of San Domingo.** *Meteorological Magazine,* 56:73–74, April **1921. DWB**—Meteorological data rare. Records from rain gages installed by General Manager, W. A. Elders, of Samaná and Santiago Railway in 1913. Map shows locations of stations. Tables are of interest, although a record of only 7 years can just show general trend. *Subject Headings:* **1. Rainfall distribution 2. San Domingo, Dominican Republic.**—*M.K.R.*

10A–46 551.583.14

Brooks, C. E. P., **Secular variation of climate.** *Geographical Review,* New York, 11:120–135, Jan. **1921.** 3 tab., 4 figs. **DLC**—Subjects considered were distribution of climatic changes, changes in tropical regions, changes in extra-tropical regions, Northwestern Europe, storm belt of the Southern Hemisphere, temperate North America, monsoon area of southeastern Asia, practical value of the study, the governing factor in temperature variation, tendency toward decreasing deviation from normal. This is a preliminary survey, information being insufficient. (*Same item as* G–185, July 1950, *MAB.*) *Subject Heading:* **1. Climatic trends.**—*M.K.R.*

10A–47 551.590.21

Brooks, C. E. P., **Sunspots and weather.** *Meteorological Magazine,* London, 56(665):113–117, June **1921.** 17 refs. **DWB**—Discusses various theories of correlation between sunspots and weather. Concludes with quotation, "1. If there were no variation in solar radiation the atmospheric motions would establish a stable system with exchanges of air between equator and pole and between ocean and land, in which the only variations would be daily and annual changes set in operation by the relative motions of the earth and sun. 2. The existing abnormal changes which we call weather have their origin chiefly, if not entirely, in the variation of solar radiation." *Subject Heading:* **1. Sunspot effects on weather.**—*M.K.R.*

10A–48 551.501.4:551.524

Brooks, C. E. P., **True mean temperature.** *Monthly Weather Review,* 49(4):226–229, April **1921.** 2 figs., 4 refs., 22 eqs. **DWB**—The disadvantages of $(M+n)/2$ are pointed out and a number of alternatives considered. $(7+1$ or $2+2\times 9\text{pm})/4$ is recommended. *Subject Heading:* **1. Temperature calculations.**—*C.E.P.B.*

1922

10A–49 551.524.37

Brooks, C. E. P., **The cold spell in May.** *Meteorological Magazine,* 57(677):177–179, Aug. **1922.** Table, 3 refs. **DWB**—A discussion of "May freeze" or so-called "periodic cold spell" occurring in May. Concludes that such spells are not strictly periodic, are not caused by spring break-up of polar ice, may be caused by northerly winds due to an area of high pressure over the North Sea or eastern North Atlantic. *Subject Heading:* **1. May frosts.**—*M.K.R.*

10A–50 551.577.38:551.509.33(410)

Brooks, C. E. P. and Glasspoole, J., **The drought of 1921.** *Royal Meteorological Society, Quarterly Journal,* 48(202):139–168, April **1922.** 21 figs., 10 tables. **DWB**—A. The rainfall of the British Isles, gives percent of average for England, England and Wales, Scotland, Ireland and British Isles, for 9 droughts, 1864 to 1921, with maps. B. Causes of drought in the British Isles, discusses world maps of deviations of pressure for these droughts. There are two types, high pressure over British Isles and, less common, high pressure to the north. Relations of droughts to sunspot cycle, Arctic ice, Atlantic circulation and preceding pressure distributions are also discussed. (*Same item as* 2B–27, Feb. 1951, *MAB.*) *Subject Headings:* **1. Drought 2. Long range forecasting 3. Pressure anomalies 4. British Isles.**—*C.E.P.B.*

10A–51 551.582(666)

Brooks, C. E. P., **Notes on the climatology of the British Empire—Sierra Leone.** *Royal Meteorological Society, Quarterly Journal,* 48(203):272–276, July **1922.** tables. **DWB**—Climate is notoriously unhealthy, with great heat and heavy rainfall. The southwest monsoon makes the summers especially rainy. Records cover years 1875–1920. Table I. Means and extremes, pressure, temperature, rainfall, wind. Table II. Percentage frequency of winds, 1911–1920. Table III. Rainfall at Sierra Leone, monthly and yearly, 1875–1921. *Subject Headings:* **1. Local climates 2. Sierra Leone.**—*M.K.R.*

10A–52 551.524.34(4)

Brooks, C. E. P., **A period of warm winters in Europe.** *Meteorological Magazine,* London, 57:203–205, **1922.** fig., 2 refs. **DWB**—A chart shows temperature difference, Dec.–Feb., 1911–1920 minus 1851–1910 in Europe. One of the first records of the present change of climate. (*Same item as* G–186, July 1950, *MAB.*) *Subject Headings:* **1. Climatic variations 2. Warm winters 3. Europe.**—*C.E.P.B.*

10A–53 551.577.2(87)

Brooks, C. E. P., **The rainfall of Venezuela.** *Royal Meteorological Society, Quarterly Journal,* 48:69–71, Jan. **1922. DWB**—In spite of scant information (17 stations in 1920), the following tables have been worked out: I. Rainfall, 1920. II. Summary of rainfall in percent. III. Normal rainfall in Venezuela and Trinidad (Caracas—27 years, El Peru—9 years, Port of Spain—58 years). Map for 1920. *Subject Headings:* **1. Rainfall distribution 2. Venezuela.**—*M.K.R.*

1923

10A–54 551.513.3:551.543:551.509.33

Brooks, C. E. P., **The east-west oscillation of the Icelandic minimum as shown by monthly pressure charts.** *Meteorological Magazine,* London, 58(692):173–178, Sept. **1923.** 2 figs., 2 tables, 4 refs. **DWB**—A curve of W-E oscillations 1873–1916 shows a maximum at 11–12 months, but individual oscillations varied from 5 to 21 months. Probably a self-regulating mechanism of about 12 months but too variable for use. (*Same item as* 2B–31, Feb. 1951, *MAB.*) *Subject Headings:* **1. Icelandic low 2. Pressure variations 3. Long range forecasting.**—*C.E.P.B.*

10A–55 551.506.2(87)

Brooks, C. E. P., **Meteorological observations at El Peru, Venezuela.** *Royal Meteorological Society, Quarterly Journal,* 49:229–230, Oct. **1923. DWB**—Observations have been made at El Peru in the Orinoco Valley since 1910. Rarity of such observations makes table of averages valuable. Pressure, temperature, relative humidity, cloudiness, and rainfall are tabulated. *Subject Headings:* **1. Meteorological observations 2. El Peru, Venezuela.**—*M.K.R.*

10A–56 551.506(410)

Brooks, C. E. P., **Sea temperature, pressure distribution and weather of May, 1923.** *Meteorological Magazine,* London, 58:100–102, June **1923.** 5 refs. **DWB**—Abnormally cold, showery weather of May 1923 due to persistent northwesterly winds, a steep pressure gradient between an anticyclone over the North Atlantic and a depression over southern Norway—all traced back to abnormal summer of 1921. *Subject Headings:* **1. Weather anomalies 2. British Isles.**—*M.K.R.*

10A–57 523.746:551.481.1(674)

*Brooks, C. E. P., **Variations in the levels of the Central African lakes, Victoria and Albert.** *Great Britain. Meteorological Office, Geophysical Memoirs,* 2(20):335–344, **1923.** fig., 7 tables. **DWB**—Victoria is the second largest body of fresh water in the world and is of great meteorological interest because of the way its level changes according to the number of visible sunspots. Seven

tables show: Average rainfall over Uganda; Mean readings at Lake Albert; Maximum and minimum readings at Kisumu, Lake Victoria; Monthly normals of rainfall and lake levels; Correlation coefficients; Early records for Lake Victoria; Daily range of lake level and temperature, monthly rainfall. Plate shows graph of lake levels, rainfall and sunspots. *Subject Headings:* **1. Lake levels 2. Sunspot cycles 3. Lake Victoria 4. Lake Albert.**—*M.K.R.*

10A–58 551.586(410)

Brooks, C. E. P., **Weather influences on the British Isles.** *Nature*, London, 112:834–836, Dec. 8, **1923. DLC**—Of the two classes of weather influences, solar and terrestrial, the latter, aside from seasonal temperature changes, has the greatest control. Four types of weather are mentioned: southerly, westerly, northerly, and easterly, the main causes of which are three centers of action: 1. area of low pressure generally near Iceland or southern Greenland (Icelandic minimum); 2. area of high-pressure in eastern Atlantic near and south of Azores (Azores anticyclone); 3. (in winter) area of high pressure centered in Siberia and extending towards Azores anticyclone. Ocean currents and floating ice are the most important factors. Normal oceanic circulation and pressure distribution are known. If deviation from normal pressure were known, abnormalities could be forecast, but a large statistical basis must first be compiled. *Subject Headings:* **1. Meteorological influences 2. British Isles.**—*M.K.R.*

1924

10A–59 551.506.2(410)

Brooks, C. E. P., **The abnormal weather of the winter and early spring, 1923–24.** *Meteorological Magazine*, London, 59:79–82, May **1924.** fig. **DWB**—November and December, 1923, had abnormally frequent northerly and easterly winds, low precipitation; February and March, 1924, were distinctly dry; January was mild, unsettled, rather rainy. Causes given were unusually low pressure; high air temperatures at Spitsbergen; an open White Sea. The season is compared to a similar situation 1894–95. Conclusion: Processes at work automatically bring about a swing of the pendulum and maintain balance of climate from year to year. *Subject Headings:* **1. Weather anomalies 2. British Isles.**—*M.K.R.*

10A–60 517.512.2

Brooks, C. E. P., **The difference-periodogram: a method for the rapid determination of short periodicities.** *Royal Society of London, Proceedings*, Ser. A, 105:346–359, March **1924. DLC**—First the basis of the method is explained, illustrated by two figures. In the second section examples of the application of the method are given, with two tables and two figures. The appendix also has two tables. *Subject Heading:* **1. Periodogram analysis.**—*M.K.R.*

10A–61 551.577.2/3(676)

Brooks, C. E. P., **The distribution of rainfall over Uganda, with a note on Kenya Colony.** *Royal Meteorological Society, Quarterly Journal*, 50(212):325–338, Oct. **1924.** charts, tables, diagr. **DWB**—Based on material sent regularly to Meteorological Office by Uganda Botanical, Forestry and Scientific Dept. and by Uganda Railway. Few records before 1900. The following are presented in seven tables: List of stations with mean annual rainfall; Rainfall (monthly sum) in inches; Average number of rain days; Maximum fall in 24 hours in inches; Highest and lowest monthly and annual falls, in inches; Mean rainfall in percentage of normal; Monthly distribution in percentage of annual. *Subject Headings:* **1. Rainfall distribution 2. Uganda.**—*M.K.R.*

10A–62 551.515.13:551.8

Brooks, C. E. P., **The question of the permanence of cyclone tracks.** *Meteorological Magazine*, London, 59:156–158, Aug. **1924. DWB**—Discusses theories put forth by MARSDEN MANSON in his **Physical and geological traces of the cyclone belt across North America** (*Monthly Weather Review*, 52:102, **1924**). BROOKS points to another conclusion, but does not entirely reject MANSON'S. Concludes with "the most that can be claimed is that the storm tracks have swung north and south with the varying physical geography of the earth, and that at present the tracks occupy more or less their average position." *Subject Headings:* **1. Cyclone tracks 2. Geology.**—*M.K.R.*

10A–63 551.577.32

Brooks, C. E. P., **The wet weather of April to August, 1924.** *Meteorological Magazine*, 59:178–182, Sept. **1924.** 2 figs., table. **DWB**—Table shows abnormally heavy rainfall (percentage of average) from April to August. Cause appeared to be a progressive movement of low pressure centers (illustrated by two charts). BROOKS finds a positive correlation between pressure difference Sydney (Nova Scotia)-Ivigtut (south Greenland) in January to March and the pressure over Western Europe the following April to June. *Subject Headings:* **1. Rainy seasons 2. British Isles.**—*M.K.R.*

1925

10A–64 551.515.42:551.594.6

*Brooks, C. E. P., **The distribution of thunderstorms over the globe.** *Great Britain. Meteorological Office, Geophysical Memoirs*, 3(24):147–164, **1925.** 7 figs., 8 tables, 13 refs. **DLC, DWB**—This monograph has been quoted in nearly every work on sferics or thunderstorm electricity since it appeared. An estimate was made of the number of thunderstorms occurring each day, month and year over the entire globe, and from those data the number of lightning strokes per second (100) or per hour (360,000), and hence 1800 thunderstorms were going on at any moment. The areas of maximum frequency at any given season coincide very closely with the sferics source or directional frequency data obtained by other methods since 1925. (*Same item as* H–23, Aug. 1950 and 4K–37, Nov. 1953, *MAB.*) *Subject Headings:* **1. Global thunderstorm distribution 2. Lightning frequencies 3. Sferics from thunderstorms.**—*M.R.*

10A–65 551.506.3:551.577.3:902

Brooks, C. E. P., **Long period variations in the rainfall of Great Britain.** *Meteorological Magazine*, London, 60(713):105–109, June **1925. DWB**—From old records percentages were obtained for 1677–1686, 1689–1693, 1697–1703, 1704–16, 1726–30. None before 1677. Table I. made up from old records, by decades, 1731–1800. Table II. frequency of storms, floods and droughts, 1001–1750. Graph represents rainfall since 1000 A.D. *Subject Headings:* **1. Long period records 2. Historic rainfall records 3. Great Britain.**—*M.K.R.*

10A–66 551.583.7:551.311.181(268)

Brooks, C. E. P., **The problem of warm polar climates.** *Royal Meteorological Society, Quarterly Journal*, 51(214):83–94, April **1925.** fig., table, 6 refs. Discussion p. 92–94. **DLC**—Sets out theory of natural instability of an ice-cap and argues that a comparatively small access of heat to the Arctic Ocean would suffice to clear away the ice and raise temperature by about 25°C. Only two types of oceanic polar climate are possible, glacial and mild, and these have alternated throughout glacial time. (*Same item as* G–30, July 1950 and 5I–20, Sept. 1954, *MAB.*) *Subject Headings:* **1. Geological climates 2. Arctic sea ice 3. Climatic changes.**—*C.E.P.B.*

10A–67 551.577.37(410):551.543

Brooks, C. E. P., **Weather in relation to pressure distribution, September, 1924 to February, 1925.** *Meteorological Magazine*, 60(710):29–32, March **1925.** Wet weather and corresponding low pressure of previous summer continued, with scarcely a break, through the winter. Explanation: weak trade wind circulation in spring and lack of ice in East Greenland current. Chart shows pressure deviations from normal, Aug. 1924–Jan. 1925. *Subject Headings:* **1. Rainy spells 2. Pressure anomalies.**—*C.E.P.B.*

1926

10A–68 551.509.33:551.54

Brooks, C. E. P. and Quennell, W. A., **Classification of monthly charts of pressure anomaly.** *Great Britain. Meteorological Office, Geophysical Memoirs*, 4(31), **1926.** 12 p. 36 figs., 4 tables. **DWB**—Charts are given showing pressure and difference from normal for selected months, and 29 types of deviations from normal. Frequency, sequence and associated weather over British Isles are briefly discussed. (*Same item as* 2B–55, Feb. 1951, *MAB.*) *Subject Headings:* **1. Weather types 2. Long range forecasting 3. Pressure anomalies 4. Northern Hemisphere.**—*C.E.P.B.*

10A–69 551.583.7

Brooks, C. E. P., **Climatic changes during geological times.** *Nature*, London, 118:15–17, July 3, **1926**; 53–55, July 10, **1926. DLC**—I. Glacial and genial periods. Alternation of these periods is considered and the association of glaciation with mountain-building, of warmth with periods of rest. WEGENER's theory of "pole-wandering" and "continental drift" is also considered. II. Causes of geological changes of climate. Various theories are considered: WEGENER's, astronomical theory, carbon dioxide theory, reversal of oceanic circulation, the cooling power of land and sea ice, and the geographical theory. *Subject Heading:* **1. Geological climates.**—*M.K.R.*

10A–70 551.583.3

Brooks, C. E. P., **Climatic changes in America.** *Meteorological Magazine*, London, 61:11–13, Feb. **1926. DWB**—An attempt to combine evidence presented by authors of the four papers in Quaternary Climates (*Carnegie Institution of Washington, Publication*, 352, July **1925**) and to deduce an account of climatic change which does not conflict with any of the facts. *Subject Headings:* **1 Postglacial. climates 2. North America.**

10A–71 551.577.3:551.555.1

Brooks, C. E. P., **The edge of the doldrums.** *Meteorological Magazine*, 61:41–44, March, **1926.** fig. **DWB**—Rainfall and winds as recorded on islands between 5°N and 5°S are discussed: Christmas Island, Malden Island, Ocean Island. Table I. Relation of rainfall to wind "constancy." Table II. Relation of rainfall to wind direction. Results—greatest source of rain in occurrence of winds of conflicting directions. The "edge of the doldrums may be taken as the line along which the solid current of the trade winds breaks up into eddies." *Subject Headings:* **1. Rainfall variations 2. Doldrums 3. Pacific.**—*M.K.R.*

10A–72 551.465(263):551.555.1:551.543

Brooks, C. E. P., **The effect of the fluctuations of the Gulf Stream on the distribution of pressure over the eastern North Atlantic and Western Europe.** *Great Britain. Meteorological Office, Geophysical Memoirs*, 4(34), **1926.** 36 p. 11 figs., 26 tables. **DWB.** Summary by A. J. Henry in *Monthly Weather Review*, 55:359–361, **1927. DWB**—Correlation coefficients are given between NE and SE trades and subsequent pressure over Western Europe. A lag of 4 months after the NE trades is found to be especially significant. Pressure at Havana and pressure differences Bermuda–Charleston and Bermuda–Sydney are also considered. The results are interpreted in terms of sea temperature. (*Same item as* 2B–52, Feb. 1951, *MAB.*) *Subject Headings:* **1. Gulf Stream variations 2. Trade wind variations 3. Pressure variations.**—*C.E.P.B.*

10A–73 551.524.36

Brooks, C. E. P., **Extremes of temperature.** *Meteorological Magazine*, 61:156–161, Aug. **1926.** 3 tables, footnote refs. **DWB**—Discusses "black bulb" temperatures—giving maxima, highest temperatures recorded by objects exposed to sun and air, highest shade temperatures, highest mean, highest wet bulb, absolute minimum—surface and air, lowest shade, lowest mean. *Subject Heading:* **1. Temperature extremes.**—*M.K.R.*

10A–74 551.583.7:551.735

Brooks, C. E. P., **The meteorological conditions during the glaciation of the present tropics: being some remarks on the climatological basis of Wegener's theory of continental drift.** *Royal Meteorological Society, Quarterly Journal*, 52(219):251–262, July **1926.** fig. **DWB**—Disagrees in part at least with WEGENER's theory. Using most recent reconstruction of Upper Carboniferous geography, BROOKS endeavors to describe the climate. Discussion: 260–262. *Subject Headings:* **1. Paleoclimates 2. Carboniferous glaciation.**—*M.K.R.*

10A–75 551.577.37(410)

Brooks, C. E. P., **Pressure distributions associated with wet seasons in the British Isles.** *Royal Meteorological Society, Quarterly Journal*, 52(220):387–403, Oct. **1926.** 14 figs., table. Discussion p. 402–403. **DWB**—Pressure anomalies are drawn for Northern Hemisphere for 14 rainy spells over Britain. Two types are distinguished, center of deficit over or near Iceland and over British Isles. Causes discussed are preceding variations of northeast and southeast trades, NW winds between Newfoundland and Greenland, ice in East Greenland Current or off Iceland. (*Same item as* 2B–53, Feb. 1951, *MAB.*) *Subject Headings:* **1. Rainy spells 2. Pressure anomalies 3. British Isles.**—*C.E.P.B.*

10A–76 551.590.21:061.3

†Brooks, C. E. P., **The relations of solar and meteorological phenomena: a summary of the literature from 1914 to 1924 inclusive, being a continuation of the summary published as "Temperature variations in the North Atlantic Ocean and in the atmosphere by** BJORN HELLAND-HANSEN **and** FRIDTHOF NANSEN. *International Council of Scientific Unions, Brussels, First Report of the Commission for the Study of Solar and Terrestrial Relationships*, Paris, **1926.** p. 66–100 (English), 163–200 (French). 100 refs. **DLC**—This exhaustive digest gives separate abstracts of 100 papers, classified under: temperature (p. 69–75), pressure (p. 75–83), wind (p. 83), rainfall, tree-growth and lake levels (p. 83–89), harvest cycles, fluctuations of animals (p. 89), cloudiness (p. 89–90), the sun and atmospheric electricity (p. 90) and theoretical relationships (p. 90–94). (For an abstract of HELLAND-HANSEN and NANSEN, *see* 8A–1, Jan. 1957, *MAB.*) *Subject Headings:* **1. Solar influences 2. International Commission on Solar-Terrestrial Relationships.**—*C.E.P.B.*

10A–77 551.506.3(262)

Brooks, C. E. P., **Tables of averages and extremes for Gibraltar and Malta.** *Royal Meteorological Society, Quarterly Journal*, 52:24–26, Jan. **1926.** tables. **DWB**—Similar typical Mediterranean climatic province, with mild, rather rainy winters and hot dry summers—more rain at Gibraltar. Two tables show pressure, temperature, relative humidity, cloud amount, rain wind. *Subject Headings:* **1. Meteorological observation 2. Gibraltar 3. Malta.**—*M.K.R.*

10A–78 551.583.14(263)

*Brooks, C. E. P., **The variation of meteorological elements at St. Helena and at some other places in the Atlantic region.** *Great Britain. Meteorological Office, Geophysical Memoirs*, 33, **1926.** 13 p. 6 figs., 14 tables. **GB-MO**—Since 1892 pressure, wind velocity and temperature at St. Helena have undergone marked secular changes, due to gradual northward movement of South Atlantic anticyclone. Corresponding changes in the North Atlantic are due to an increase in the intensity of the North Atlantic anticyclone and strength of N.E. trades. *Subject Headings:* **1. Climatic trends 2. St. Helena.**—*C.E.P.B.*

10A–79 551.543:551.509.33

Brooks, C. E. P., **The variations of pressure from month to month in the region of the British Isles.** *Royal Meteorological Society, Quarterly Journal*, 52(219):263–276, July **1926.** 6 figs., 4 tables. Discussion p. 275–276. **DWB**—Study of movements of centers of positive and negative monthly pressure deviations in the Northern Hemisphere. These mostly move from a westerly to an easterly point, and standard paths are laid down. Value for long range forecasting is discussed. (*Same item as* 2B–54, Feb. 1951, *MAB.*) *Subject Headings:* **1. Pressure anomalies 2. Long range forecasting.**—*C.E.P.B.*

10A–80 551.506.2:551.543

Brooks, C. E. P., **The weather of the past summer.** *Meteorological Magazine*, 61:231–233, Nov. **1926. DWB**—A summary of weather conditions, April to Sept. 1926, giving some explanations and comparing with 1912. Pressure anomalies, April–Aug. 1926. *Subject Heading:* **1. Abnormal summers.**—*M.K.R.*

10A–81 551.543

Brooks, C. E. P., **The weather of the past winter.** *Meteorological Magazine*, 61:56–60, April **1926.** fig. **DWB**—Stormy winter of 1925–26 is compared with that of 1898–99. 1912 is compared also. Pressure subnormal over North Atlantic, high in Scandinavia. Rainfall of British Isles 156% of normal in Jan., 117% in Feb. *Subject Heading:* **1. Pressure variations.**—*M.K.R.*

1927

10A–82 551.577.37/8

Brooks, C. E. P., **Abnormal rainfalls.** *Meteorological Magazine*, 62(733):1–5, Feb. **1927. DWB**—Places and dates of heaviest rainfalls are given. Table, quoted from *Monthly Weather Review*, 47:302, **1919,** and other sources, lists greatest 24 hr rainfalls. Cherrapunji in India and Mt. Waialeale in Hawaiian Islands seem to have heaviest annual. Question of smallest rainfall is also discussed. *Subject Headings:* **1. Rainfall extremes 2. Droughts.**—*M.K.R.*

10A–83 551.583.3

Brooks, C. E. P., **The climate of prehistoric Britain.** *Antiquity*, 1:412–418, Dec. **1927.** 2 figs. **DLC**—A succession of dry and wet periods in post-glacial times is described. Similar changes in short periods in recent years are illustrated as analogies. *Subject Headings:* **1. Post-glacial climates 2. British Isles.**—*C.E.P.B.*

10A–84 551.515.1(09)

Brooks, C. E. P., **An early essay in cooperative meteorology: the great storm of 1703.** *Meteorological Magazine*, 62:31–35, March **1927.** figs. **DWB**—A description of the storm of Nov. 26–27, 1703, taken principally from records published by Daniel Defoe and an attempt to reconstruct the storm meteorologically. Fig. 1. Barometric readings; Fig. 2. Pressure and wind about 4:00 a.m., Nov. 27, 1703. *Subject Heading:* **1. Historic storms.**—*M.K.R.*

10A–85 551.506.5:04(26)

Brooks, C. E. P., **The expedition of the "Meteor."** *Meteorological Magazine*, 62(740):173–176, Sept. **1927. DWB**—Description of plans of Alfred Merz, oceanographer and meteorologist for the German Atlantic Expedition in the "Meteor," which took place 1925–27. Temperature and salinity soundings at 310 stations, 14 crossings of Atlantic between 20°N and northern edge of Antarctic ice. 812 pilot balloon ascents. Four oceanographers and two meteorologists were included. *Subject Headings:* **1. "Meteor" Expedition, 1925–1927. I. Merz, Alfred.**—*M.K.R.*

10A–86 551.588.6:551.577

Brooks, C. E. P., **The influence of forests on rainfall.** *Empire Forestry Journal*, 6(2):210–215, **1927. DA.** Full summary in *Water and Water Engineering*, 29(345):368–371, Sept. 20, **1927. DGS.** Summary also in *British Association for the Advancement of Science, Report of the 95th Meeting,*

eeds, 1927. **1927.** p. 392–393. **DLC**—Discussion of question: does the area under forests affect ne amount of water precipitated from the air. Conclusions: 1) Replacement of forests by field rops or grasses probably tends to increase general rainfall slightly. 2) Forests increase local rainfall y 1 or 2%. 3) To this may be added increased supply of water collected mechanically from clouds.) Replacement of forest by crop land would decrease runoff by 10–15%. *Subject Headings:* **1. Forest ainfall 2. Forest influences on rainfall.**—*C.E.P.B.*

10A–87 551.576.2

Brooks, C. E. P., **The mean cloudiness over the earth.** *Royal Meteorological Society, Memoirs,* (10):127–138, Sept. **1927. DWB**—A study based upon 1000 land stations, well distributed over ne earth and data from ships' logs. Maps and tables give statistics. Southern Hemisphere found) be cloudier than northern. Annual variation greater over land than sea. *Subject Headings:* **. Cloud amount 2. World.**—*M.K.R.*

10A–88 551.515:551.58

Brooks, C. E. P. and Milward, E. G., **Monthly distribution of storms.** *Meteorological Magazine,* 2:229–232, Nov. **1927. DWB**—A discussion of the apparent tendency of storms to occur with reater frequency near the middle of the month and speculations as to reasons for this distribution. *ubject Heading:* **1. Storm frequency data.**—*M.K.R.*

10A–89 551.590.21:523.746

Brooks, C. E. P., **Non-linear relations with sunspots.** *Royal Meteorological Society, Quarterly ournal,* 53:68–71, Jan. **1927.** 5 tables. **DWB**—Five tables: I. Relations of tropical temperature) sunspot numbers. II. Levels of Lake Victoria and sunspot numbers. III. Siberian thunderstorms nd sunspot numbers. IV. Bathurst rainfall and sunspot numbers. V. Scale for correlation with S. *Subject Heading:* **1. Sunspot effects.**—*M.K.R.*

10A–90 519.241.1

Brooks, C. E. P., **Regression equations with many variates.** *Great Britain. Meteorological ffice, Professional Notes,* 4(47):1–5, **1927.** 3 tables, 15 eqs. **DWB**—Three tables are given. egression equation took 45 min. while full method requires 4 hrs. Short method recommended nly as a means of deducing formulas for interpolation or forecasting. *Subject Heading:* **1. Correlaon coefficients.**—*M.K.R.*

10A–91 551.506.2

Brooks, C. E. P., **The wet summer of 1927.** *Meteorological Magazine,* 62:204–208, Oct. **1927. WB**—Factors considered are: 1) The northeast trade wind in the Atlantic, 2) The southeast trade ind in the Atlantic, 3) The pressure difference between Newfoundland and southern Greenland, The amount of ice in the East Greenland current. Three tables: 1. Rainfall (percent of normal) uring 1927, 2. Departures from normal of various factors of British weather, 3. Deviations of essure from normal in millibars. Figs. 1–4, Pressure anomalies, 1927. *Subject Heading:* **1. Wet ummers.**—*M.K.R.*

1928

10A–92 551.543:551.311.181(268)

Brooks, C. E. P., **Arctic ice and British weather.** *Meteorological Magazine,* 63:214–217, Oct. **928.** fig. **DWB**—Arctic area is divided into four parts: 1. Neighborhood of Iceland, 2. Greenland a, 3. Barents Sea and 4. Kara Sea. Three relationships were found: a) When there is much ice in e Arctic, pressure in spring and summer tends to be above normal in the north-west and below in e south-west. b) When there is much ice in the Arctic in the spring and summer, pressure in the llowing late autumn and winter tends to be below normal in the British Isles and northern France. Similar effects tend to recur annually at northern stations for about four years following abnormal e years. (Fig. 1.) Constant reference is made to *Geophysical Memoirs,* 5(41):**1928,** of which is is a summary (*see* 10A–95). *Subject Headings:* **1. Pressure variations 2. Arctic sea ice.**—*.K.R.*

10A–93 551.524.36

Brooks, C. E. P. and Thorman, G. L., **The distribution of mean annual maxima and minima of mperature over the globe.** *Great Britain. Meteorological Office, Geophysical Memoirs,* 5(44):1–10, **28. DWB**—Annual maxima and minima are tabulated from the **Réseau Mondial** for 1910–1921. eans are plotted on world Mercator maps. Maxima range from 50–120°F., minima from −70–70°F. *Subject Heading:* **1. Temperature extremes.**—*M.K.R.*

10A–94 551.583.

Brooks, C. E. P., **Historical climatology of England and Wales.** *Royal Meteorological Society Quarterly Journal*, 54(228):309–317, Oct. 1928. 2 figs. **DWB**—Post-glacial climatic histor divided into: 1. Boreal—7500–5500 B.C. 2. Atlantic—5500–2500 B.C. 3. Sub-boreal—2500 850 B.C. 4. Sub-Atlantic—850–0 B.C. Then Roman times, Saxon and on to present time are a described, showing various cycles. *Subject Headings:* **1. Postglacial climates 2. Historical climates** —*M.K.R.*

10A–95 551.311.181(268):551.54

Brooks, C. E. P. and Quennell, W. A., **The influence of Arctic ice on the subsequent distributio of pressure over the eastern North Atlantic and Western Europe.** *Great Britain. Meteorological Office Memoirs*, 5(41), 1928. 36 p. 18 figs., 32 tables. **DWB**—Pt. I. discusses the birthplace an drift of Arctic ice. Pt. II. gives correlations of quarterly pressure at 9 stations in the same an following years with ice off Iceland, temperature at Stykkisholm, Greenland Sea ice, Jan Maye temperature, Barents Sea ice, Kara Sea ice, Siberian autumn temperatures, pressure and temperatur at Spitsbergen. The effect of ice is shown to last for 4 years. An annual "ice index" is compile for the Arctic Ocean, 1895–1924 and correlated with pressures. (*Same item as* 2B–72, Feb. 195 and 7A–216, Jan. 1956, *MAB.*) *Subject Headings:* **1. Arctic sea ice variations 2. Long rang forecasting 3. Pressure variations.**—*C.E.P.B.*

10A–96 551.577.5

Brooks, C. E. P., **The influence of forests on rainfall and run-off.** *Royal Meteorological Society Quarterly Journal*, 54(225):1–17, Jan. 1928. fig., tables. **DWB**—Loss of water considered a follows: a—Rainfall intercepted by crowns of trees and re-evaporated. b—Water evaporated from soil of forest. c—Water transpired by trees. Precipitation in general divided into: A. Rain, snow or hail (Orographical, Cyclonic, Instability showers); B. Intermediate (Fog-rain or drizzle) C. Occult precipitation (Deposit of moisture from fog, dew and hoar-frost). *Subject Heading* **1. Forest influences on rainfall.**—*M.K.R.*

10A–97 551.509.3

Brooks, C. E. P., **Long-range weather forecasting.** *Meteorological Magazine*, 63(748):81–86 May 1928. **DWB**—Since mankind has always been interested in the weather, attempts hav always been made to forecast. Early forecasts based on animals, plants, atmospheric phenomen or stars. First regular scientific forecasts in middle of 19th century. Four methods now in use 1) Periodicities, 2) Variations of solar activity, 3) Relations between meteorological conditions i different parts of the world, including ocean temperatures, and 4) Extensions of the method o synoptic forecasting. Each method is discussed and the fourth is considered to be the most useful (*Same item as* 2A–11, Jan. 1951, *MAB.*) *Subject Headings:* **1. Weather forecasting 2. Grea Britain.**—*M.K.R.*

10A–98 551.524.3

Brooks, C. E. P., **The "old-fashioned Christmas."** *Nature*, London, 122:967–968, Dec. 22 1928. **DWB**—Discusses various theories to explain belief that old-fashioned Christmases or old fashioned winters were colder and snowier. There being no statistical proof that such was the case it is suggested that the belief may have originated in a series of severe winters in the late 17th an early 18th centuries, but probably now refers to some outstanding memories in the mind of th individual speaker. *Subject Heading:* **1. Severe winters.**—*M.K.R.*

10A–99 551.579.4:62:517.512.

Brooks, C. E. P., **Periodicities in the Nile floods.** *Royal Meteorological Society, Memoirs* 2(12):9–26, Jan. 1928. 3 figs., 4 tables, refs., eqs. **NN.** Summary in *Royal Meteorological Society Quarterly Journal*, 54:303–305, Oct. 1928. **DWB**—Lists 18 periodicities, approximately 2 years t 76–78 years, found in Nile floods, A.D. 641–1451. A systematic variation in length and phase o most of the periodicities, through a cycle of about 500 years, was found. (*Same item as* 2J–116 Oct. 1951, *MAB.*) *Subject Headings:* **1. Nile floods 2. Periodogram analysis 3. Periodicities** —*C.E.P.B.*

10A–100 551.543:519.2

Brooks, C. E. P. and Quennell, Winifred A., **Persistence of pressure deviations in western Europe.** *Meteorological Magazine*, 63:42–45, March 1928. fig., 2 tables. **DWB**—Tables: I. Cor relation coefficients between pressure in successive months. II. Persistence of pressure deviation from one quarter to the next. One figure shows curve representing coefficients actually obtaine and results after smoothing. Stations used: Jacobshaven, Stykkisholm, Thorshavn, Vardo, Bergen

alentia, Paris, Berlin, Ponta Delgada, Spitsbergen. *Subject Heading:* **1. Persistence of pressure.** *M.K.R.*

10A–101 551.311.15:551.524.32

Brooks, C. E. P., **The problem of the varves.** *Royal Meteorological Society, Quarterly Journal,* (225):64–70, Jan. **1928.** fig., table. **DWB**—Varves, or layers of banded clay deposits used to etermine chronology of ice-age in Sweden. Resulting combined curve for Sweden is termed the Swedish time-scale." Employed in North America and Argentina and comparisons made. *Subject eading:* **1. Varves.**—*M.K.R.*

10A–102 551.509.33:519.27

Brooks, C. E. P. and Quennell, Winifred A., **The relations between the Nile flood and subsequent essures over the eastern North Atlantic and Western Europe.** *Royal Meteorological Society, uarterly Journal,* 54:262–267, July **1928.** fig., 3 tables, 2 refs. **DWB**—Correlation coefficients e given between Nile flood and pressure at Cairo and subsequent pressure anomalies at stations European-Atlantic region. A number of significant coefficients are found, which are attributed a common origin in variations of atmospheric circulation. (*Same item as* 2B–73, Feb. 1951, *AB.*) *Subject Headings:* **1. Long range forecasting 2. Correlations 3. Nile floods.**—*C.E.P.B.*

10A–103 523.746:551.543

Brooks, C. E. P., **Sunspots and the distribution of pressure over western Europe.** *Great ritain. Meteorological Office, Professional Notes,* 4(49):1–6, **1928. DWB**—An investigation into e relations between the position of any month, quarter or year in the 11-year sunspot cycle and the stribution of pressure over western Europe and the eastern North Atlantic. Pt. 1. The sequence pressure types during the sunspot cycle. 2 tab. Pt. 2. Deviations of pressure from normal during e sunspot cycle. 3 tab. Conclusion is that, at present, variations of sunspots in the 11-year cle cannot be taken into account in predicting quarterly mean deviations of pressure. *Subject eadings:* **1. Sunspot cycles 2. Pressure anomalies.**—*M.K.R.*

10A–104 551.577.3:621.396

Brooks, C. E. P. and Watt, Robert A. W., **Wireless and weather.** *Royal Meteorological Society, uarterly Journal,* 54:260–262, July **1928. DWB**—A scientific and statistical refutation of a popular eory that increased wireless broadcasts caused heavy rains from 1922–27. *Subject Headings:* **Rainfall variations 2. Radio wave effects.**—*M.K.R.*

1929

10A–105 551.582(51)

Brooks, C. E. P., **A contribution to the climatology of Western China.** *Royal Meteorological ociety, Quarterly Journal,* 55(232):399–403, Oct. **1929. DWB**—Information for this article was btained from long records kept at the Friends Mission Hospital, T'ung Ch'uan, in the province of ch'uan, Western China. Three tables: I. Mean temperature 1917–26. II. Precipitation in inches, 905–26. III. Meteorological table for T'ung Ch'uan, 1917–26, except rainfall (1905–26). A cord was kept, also, of phenomena—hail, floods, etc. Wind was not recorded until nearly the end the record. *Subject Headings:* **1. Local climatology 2. Western China.**—*M.K.R.*

10A–106 551.506.2(410)

Brooks, C. E. P., **The dry weather of January to June, 1929.** *Meteorological Magazine,* 64(762): 29–132, July **1929. DWB**—Following the previous unusually cold winter, an intense drought llowed, exceeded only by the period Oct. 1879–Jan. 1880. Figure shows pressure anomalies eb.–May 1929. A discussion of various causes concludes that cause is some factor, perhaps in pper air, which has not yet been investigated. *Subject Headings:* **1. Weather anomalies 2. British les.**—*M.K.R.*

10A–107 551.578.71

Brooks, C. E. P., **Formation of hail.** *Discovery,* London, 10(117):305–308, Sept. **1929.** 2 figs. **LC**—Article written in popular style. Deals particularly with formation and growth of hailstones. *Same item as* D–31, April 1950, *MAB.*) *Subject Heading:* **1. Hail formation.**—*M.L.R.*

10A–108 551.543:551.21

Brooks, C. E. P. and Hunt, Theresa M., **The influence of explosive volcanic eruptions on the ubsequent pressure distribution over western Europe.** *Meteorological Magazine,* London, 64(766): 26–229, Nov. **1929. DWB**—Seven groups of explosions, 1875–1914, are compared with subsequent uarterly pressures at Stykkisholm and Ponta Delgada. Pressure in Oct.–Dec. following eruptions

is found to average 4.2 mb below normal at Stykkisholm. (*Same item as* F–65, June 1950, *MAB. Subject Headings:* **1. Pressure variations 2. Volcanic eruptions.**—*C.E.P.B.*

10A–109 551.506.5(661)

*Brooks, C. E. P. and Mirrlees, S. T. A., **The meteorological results of journeys in the Southern Sahara, 1922 and 1927, made by Francis Rennell Rodd.** *Great Britain. Meteorological Office. Geophysical Memoirs*, No. 48, 1929. 40 p. map, 6 figs., 25 tables, plus appended tables, refs. **DWB** (551.05 G786g)—After a geographical introduction by F. R. Rodd, the general climate, instrumental equipment and methods of observation are described. Authors then take up in turn pressure, temperature, humidity, winds, amount and type of clouds, rain and other phenomena (sandstorms, thunder, lightning, dust devils), and visibility (including mirage). Daily observations are given for April to Dec. 1922 and May to Dec. 1927. The appendix reproduces the **Meteorological diaries kept by F. R. Rodd, 1922 and 1927.** (*Same item as* 3A–106, Jan. 1952, *MAB.*) *Subject Headings:* **1. Expeditionary climatic data 2. Sahara. I. Rodd, Francis Rennell.**—*C.E.P.B.*

10A–110 551.521.11:551.576.

Brooks, C. E. P., **The relation between the duration of bright sunshine registered by a Campbell-Stokes sunshine recorder and the estimated amount of cloud.** *Great Britain. Meteorological Office. Professional Notes*, 4(53):1–15, 1929. 8 tables, 9 eqs. **DWB** (M(055)G786p)—A preliminary study towards the construction of a conversion formula so that cloud observations can be used to supplement instrumental measurements of sunshine in order to obtain charts showing the duration of bright sunshine in different parts of the globe. Sunshine recorders are scarce in many land areas and non-existent over the ocean and are of varying types. The action of sunshine recorders in various areas is compared. *Subject Headings:* **1. Sunshine duration 2. Cloudiness.**—*M.K.R.*

10A–111 551.577.2:551.576.2

Brooks, C. E. P., **The relations between annual rainfall and the average amount of cloud.** *Meteorological Magazine*, 64:255–258, Dec. 1929. figs., tables. **DWB**—Table I. Values of the constants a and b in the equation $R=a+bC$. Fig. 1. Values of a. Fig. 2. Values of b. Table II. Rainfall over the land, calculated from cloudiness, and estimated by Kerner. *Subject Headings:* **1. Rainfall amount 2. Cloudiness effects.**—*M.K.R.*

10A–112 551.54.

Brooks, C. E. P. and Quennell, W. A., **Variations of pressure distribution in the Northern Hemisphere during the period 1904–13 based on ten-day means.** *Great Britain. Meteorological Office, Professional Notes*, 4(54):1–14, 1929. 8 tables, 2 figs. **DWB** (M(055)G786p)—Excess and deficit of pressure were considered for the following areas: 1. Over or near Scandinavia, 2. From British Isles across Europe, 3. Over British Isles, 4. Near Iceland or southern Greenland, 5. Over the Arctic generally. General result of investigation confirms results of previous studies, using monthly charts. A center of deficit might be produced either by a single depression along a looped path or by a series of depressions converging on a small area, but they may not necessarily be of the same nature. *Subject Heading:* **1. Pressure anomalies.**—*M.K.R.*

10A–113 551.524.37(410)

Brooks, C. E. P., **The winter weather of December, 1928, and January and February, 1929.** *Meteorological Magazine*, 64(757):1–4, 1929. fig. A discussion of the deviations from normal temperature and pressure of this unusually cold winter and of possible causes. Figure shows pressure anomalies. *Subject Headings:* **1. Severe winters 2. British Isles.**—*M.K.R.*

1930

10A–114 551.583.7:551.781(788,792)

Brooks, C. E. P., **The climate and weather of the Middle Eocene in western America.** *Meteorological Magazine*, 65:266–267, Dec. 1930. **DWB**—Discusses Bradley, Wilmot H., **The varves and climate of the Green River Epoch,** *U. S. Geological Survey, Professional Paper*, 158-E, 1929. Concerns Gosiute Lake, formerly occupying 12,300 sq mi in Colorado and Utah. Three well marked periodicities—12 years, fifty years, 21,630 years. "A real example of the effect of astronomical variations in changing climate." *Subject Headings:* **1. Geological climates 2. Periodicities.**—*M.K.R.*

10A–115 551.583.2

*Brooks, C. E. P., **The climate of the first half of the eighteenth century.** *Royal Meteorological Society, Quarterly Journal*, 56(237):389–402, Oct. 1930. fig., 11 tables. **DWB**—Following the introduction, Dr. Brooks discusses the reliability of early rainfall observations, the rainfall of

urope, the level of the Nile, the oak tree of Tunis, the level of the Caspian, droughts and floods in hina, tree growth in California, the level of the Lake of Mexico, winds, temperatures in winter and ring, temperatures in summer, the probable distribution of pressure between about 1730 and 1750. *ubject Headings:* **1. Climatic variations 2. Historic climates.**—*M.K.R.*

10A–116 551.524.32(421)

Brooks, C. E. P., **Irregularities in the annual variation of temperature in London.** *Nature*, ondon, 126:61–63, July 12, **1930. DLC**—An investigation of BUCHAN's theory of cold periods id warm periods, 1869. Conclusion is that it is improbable that there is an abiding tendency for ny part of the year to be either abnormally warm or abnormally cold for the season, though such ndencies may spring up, persist for ten, twenty or thirty years and then vanish. *Subject Headings:* **Temperature singularities 2. London, Eng.**—*M.K.R.*

10A–117 551.524.32(421)

Brooks, C. E. P. and Mirrlees, S. T. A., **Irregularities in the annual variation of the temperature London.** *Royal Meteorological Society, Quarterly Journal*, 56(237):375–388, Oct. **1930.** 2 tables, figs. **DWB**—The article is divided into the following sections: 1) Statement of the problem;) The smoothed daily means and the general curve; 3) The general course of temperature in the vo periods, 1871–1900 and 1901–29; 4) The question of recurrencies; 5) A possible cold period at the id of July; 6) The possible warm periods in mid-July and mid-August; 7) Possible warm period at ie end of May; 8) Buchan's cold periods in individual years; and 9) Summary of conclusions— nprobable that there exists any abiding tendency for any part of the year to be abnormally warm r cold for the season. Such tendencies seem to spring up suddenly, continue ten, twenty or thirty ears and vanish. *Subject Headings:* **1. Temperature singularities 2. London, Eng.**—*M.K.R.*

10A–118 551.588.1

Brooks, C. E. P., **The role of the oceans in the weather of western Europe.** *Royal Meteorological ociety, Quarterly Journal*, 56(234):131–140, April **1930,** fig. **DLC, DWB**—Summarizes briefly uthor's work (*Geophysical Memoirs*, 34, **1926** and 41, **1928**) on correlation of pressure anomalies in ie European-Atlantic region with preceding variations of Atlantic trade winds and ice conditions the Arctic. The results are tentatively explained from the physical viewpoint. (*Same item as* B–95, Feb. 1951 and 5A–132, Jan. 1954, *MAB.*) *Subject Headings:* **1. Oceanic influences 2. Cli- iate of Western Europe 3. Sea ice 4. Long range forecasting 5. Sea temperature variations.** —*C.E.P.B.*

10A–119 551.506.2(410)

Brooks, C. E. P., **The weather of the past winter—some comparisons.** *Meteorological Magazine*, 5(770):29–32, March **1930. DWB**—Season, Dec. 1929–Feb. 1930, is compared with that of 1912– 3. Fig. shows pressure anomalies in two winters. *Subject Headings:* **1. Weather summaries British Isles.**

10A–120 551.577.2

*Brooks, C. E. P. and Hunt, T. M., **The zonal distribution of rainfall over the earth.** *Royal Meteorological Society, Memoirs*, 3(28):139–158, Sept. **1930.** 5 figs., 11 tables. **DWB**—Average nnual rainfall and volume of water by 5° zones of latitude estimated for land and sea and for whole arth, and compared with previous estimates. Monthly values given for land and sea and whole arth. Average rainfall of continents. *Subject Heading:* **1. Rainfall distribution.**—*C.E.P.B.*

1931

10A–121 551.583.2

†Brooks, C. E. P., **Changes of climate in the old world during historic times.** *Royal Meteoro- gical Society, Quarterly Journal*, 57(238):13–30, Jan. **1931.** 3 tables, 34 refs. Append I. **Note n Egyptian winds in Ptolemy's "Prognostics," and Hellmann's criticism of them,** by Mrs. L. D. awyer. Append II. **Notes on the droughts of the seventh and eighth centuries,** by C. E. Britton. **WB**—Periods discussed: 2500–2000 B.C., 800–400 B.C., The beginning of the Christian era, 00–800 A.D., 1100–1400 A.D. In each period various areas are considered. In conclusion, DR. ROOKS says his paper is as much a confession of ignorance as a contribution to knowledge. The nief need, he states, is for facts, geological, archaeological, historical and meteorological. *Subject eadings:* **1. Climatic changes 2. Historic climates.**—*M.K.R.*

10A–122 551.582(699.2)

Brooks, C. E. P., **The climate of Ascension Island.** *Royal Meteorological Society, Quarterly ournal*, 57:85–89, Jan. **1931, DWB**—Observations since 1854, a general summary in Table I

(Georgetown or Garrison). One other station—near summit of Green Mt. 7 tables in all—rainfal clouds and winds. *Subject Headings:* **1. Local climates 2. Ascension Island.**—*M.K.R.*

10A–123 551.583.

Brooks, C. E. P., **Climatic changes since the ice age.** *Victoria Institute, Journal of the Trans actions*, 63:222–236, **1931.** 4 figs., foot-refs. Discussion, p. 237–242. **DLC**—1. The close of th Ice Age. 2. The "Climatic optimum." 3. The Atlantic period. 4. The Sub-boreal period. 5. Th Sub-Atlantic period. 6. The recent period. 7. The general circulation of the atmosphere (cause by changes in intensity and distribution of solar radiation and amount of ice in Arctic Ocean 8. Dry warm periods in Northwest Europe. *Subject Heading:* **1. Postglacial period.**—*C.E.P.B.*

10A–124 551.583.7:019.94

Brooks, C. E. P., **The detailed study of geological climates.** *Meteorological Magazine*, 66:130 136, July **1931. DWB**—Summary of KERNER-MARILAUN, FRITZ, **Paläoklimatologie,** Berlin, 193 Many difficulties in research into past climates. Methods of determining probable temperature rainfall, ice distribution, etc. are discussed. Meteorologists should realize that the problems palaeoclimatology are as much meteorological as geological and offer many opportunities for researc *Subject Headings:* **1. Geological climates 2. Reviews.**—*M.K.R.*

10A–125 551.583:59

Brooks, C. E. P., **The influence of weather changes on the numbers of animals.** *Meteorologica Magazine*, 66(784):77–80, May **1931.** 6 refs. **DWB**—Animals considered: lemmings of southe Norway (3.6 year cycles); Arctic fox of Canada (3.6 year cycles); Canadian rabbit and lynx, beave —no periodic fluctuation. Prolific animals have a natural biological cycle. May be some climat control, but not necessarily periodic. Merits further research by biologists and meteorologist *Subject Headings:* **1. Weather cycles 2. Animals.**—*M.K.R.*

1932

10A–126 551.543:551.311.181(268/8

Brooks, C. E. P., **The influence of the ice in Davis Strait on the weather of the British Isles** *Meteorological Magazine*, London, 67(799):153–156, Aug. **1932.** 2 figs. **DWB**—Severity of ic conditions was correlated with overlapping 3-month means of pressure at 9 stations in weste Europe and eastern North Atlantic, 1895–1927, up to 2 years later. Much ice is followed by a excess of pressure over the British Isles (+5 mb) and France late in the following year. (*Same ite as* 2B–112, Feb. 1951, *MAB.*) *Subject Headings:* **1. Pressure variations 2. Sea ice 3. Davis Strai** —*C.E.P.B.*

10A–127 551.510.42:551.21:551.55

Brooks, C. E. P., **The movement of volcanic dust over the globe.** *Meteorological Magazin* London, 67(796):81–86, May **1932.** 2 figs., refs. **DWB**—Isochrones of spread of main dust cloud and optical phenomena following Krakatoa eruption of Aug. 26–27, 1883 are given and compare with general movements of cirrus and cirrostratus clouds on Oct.–Dec. (*Same item as* F–26, Jun 1950, *MAB.*) *Subject Headings:* **1. Volcanic dust movements 2. Upper winds 3. Krakato eruption.**—*C.E.P.B.*

10A–128 551.515.

Brooks, C. E. P., **The origin of anticyclones (Some problems of modern meteorology,** No. 9 *Royal Meteorological Society, Quarterly Journal*, 58:379–387, Oct. **1932. DWB**—Discusses variou theories as to the origin and movements of warm and cold anticyclones, describing some specifi anticyclones. *Subject Heading:* **1. Anticyclones.**—*M.K.R.*

10A–129 551.513(6

Brooks, C. E. P. and Mirrlees, S. T. A., **A study of the atmospheric circulation over tropica Africa.** *Great Britain. Meteorological Office, Geophysical Memoirs*, No. 55, **1932.** 15 p. 18 figs 2 tables. **DWB**—A new and more complicated theory of atmospheric circulation over a tropica continent (in this case, Africa) is developed. Pressure and wind and their relations to rainfa conditions during the different seasons are analyzed. Illustrative pressure, air movement an rainfall charts are appended. Lack of upper air data is admittedly a drawback. (*Same item a* 2J–138, Oct. 1951 and 3H–66, Aug. 1952, *MAB.*) *Subject Headings:* **1. Atmospheric circulatio 2. Tropical Africa.**—*H. P. Kramer.*

10A–130 551.553.5:902(410

Brooks, C. E. P., **Winds in London during the early 19th century.** *Meteorological Magazine* 67:56–62, April **1932. DWB**—Data from seven old diaries and records were tabulated. Some wer

iscarded because of obvious fallacies. Means of acceptable data as wind components for London each year were plotted in Fig. 1. Table I—Annual wind frequency vectors for London and dinburgh 1794–1810, 1811–1827, 1828–1840. Fig. 2—Pressures and winds, 1794–1810 compared ith 1811–1827, Edinburgh and London. Comparisons made with recent records. *Subject Head-ngs:* **1. Wind variations 2. Historic records 3. London, Eng. 4. Edinburgh, Scotland.**—*M.K.R.*

1933

10A–131 551.577.37/8

Brooks, C. E. P. and Hunt, Theresa M., **The areas with light and heavy rainfalls.** *Meteoro-gical Magazine*, 68:3–6, Feb. **1933.** figs., tables. **DWB**—Two tables: I. Percentage areas with nnual rainfall between specified limits for land and ocean. II. Average rainfall of the British Isles each degree of latitude. Two figures: 1) Percentage areas with rainfall below 10 in., 2) Percentage reas with rainfall above 100 in. *Subject Heading:* **1. Rainfall extremes.**—*M.K.R.*

10A–132 551.553.3(421):551.552:551.577.2(410)

Brooks, C. E. P. and Hunt, Theresa M., **Resultant wind direction in London: its periodicities nd its effect on rainfall.** *Meteorological Magazine*, 68:154–161, Aug. **1933. DWB**—Three figures:) Wind periodicities; 2) Rainfall (percentage of normal) London and England and Wales and esultant winds, London, winter; 3) Rainfall (percentage of normal) London and England and Wales nd resultant winds, London, summer. *Subject Headings:* **1. Wind periodicities 2. Wind direction . Rainfall amount 4. London, Eng. 5. Wales.**—*M.K.R.*

10A–133 551.553:551.513:902(410)

Brooks, C. E. P. and Hunt, Theresa M., **Variations of wind direction in the British Isles since 341.** *Royal Meteorological Society, Quarterly Journal*, 59(252):375–388, Oct. **1933.** 5 tables. **DLC**—Resultant direction and constancy of winds in winter, summer and year are given for London, 667–1685, 1713–1747, 1787–1930; Edinburgh and Perth, 1731–1736, 1754–1930; Dublin, 1725–1766, 831–1858, 1866–1930. Scattered items include winds from W. MERLE's diary, 1341–1343. Long eriod variations of wind direction are discussed. (*Same item as* G–189, July 1950, *MAB.*) *Subject leadings:* **1. Wind variations 2. Historic weather records 3. Atmospheric circulation 4. British sles**—*C.E.P.B.*

1934

10A–134 551.506:551.55:902(427)

Brooks, C. E. P., **Early wind records in Yorkshire.** *Royal Meteorological Society, Quarterly ournal*, 60:62–64, Jan. **1934. DWB**—Summaries under 8 directions extracted by C. E. BRITTON rom **New observations, natural, moral, civil, political and medical on city, town and country bills f mortality** by THOMAS SHORT, London, 1750. Observations are for Rotherham, 1715–1731. heffield, 1732–1747. Tables are given and comparisons made with recent tables for Sheffield, *ubject Headings:* **1. Wind observations 2. Historic weather records 3. Yorkshire, Eng.**—*M.K.R.*

10A–135 551.583.2:58(4)

Brooks, C. E. P., **Post-glacial climates and the forests of Europe (Some problems of modern neteorology,** No. 16). *Royal Meteorological Society, Quarterly Journal*, 60:377–395, **1934.** Discussion. y H. Godwin, *Ibid.*, 61:955–987, **1935. DWB**—Summarizes literature of pollen analysis in Europe nd gives charts of tree distribution and a discussion of the changes in post-glacial meteorological ituation. (*Same item as* G–159, July 1950, *MAB.*) *Subject Headings:* **1. Climatic changes 2. His-orical climates 3. Europe.**—*C.E.P.B.*

10A–136 551.543

Brooks, C. E. P., **Pressure distribution during December 1933 and January 1934.** *Meteoro-gical Magazine*, 69:4–6, Jan. 1934. **DWB**—Three charts: 1) Average pressure distribution Dec. 6–31; 2) Distribution during first half of Jan.; 3) Average pressure Jan. 16–31. Charts show radual building up of a long anticyclonic ridge. Whole period was one of great storminess over orthwest Europe. Continuation of note on **The pressure distribution during December, 1933.** *bid.*, p. 279–280, Feb. **1934.** *Subject Heading:* **1. Pressure variations.**—*M.K.R.*

10A–137 551.515.4:523.746

Brooks, C. E. P., **The variation of the annual frequency of thunderstorms in relation to sunspots.** *Royal Meteorological Society, Quarterly Journal*, 60:153–165, April **1934.** Discussion: 162–165. **DWB**—In the introduction, the difficulty of obtaining accurate observations of thunderstorms is escribed and two methods of expressing the data are explained. Pt. 2 gives sources of data and ncludes Table I, Annual numbers of thunderstorms (percentage of average). Pt. 3 includes Table

II, Correlation coefficients, sunspots and thunderstorms. Pt. 4 includes Table III, Arrangement of data for harmonic analysis, Table IV, The 11½-year cycle of thunderstorms, a chart of cyclic variation of thunderstorms and sunspots and Table V, Total amplitude of thunderstorm cycle. *Subject Headings:* **1. Thunderstorm frequencies 2. Sunspot cycles.**—*M.K.R.*

10A–138 551.553:902:551.311.31(429)

Brooks, C. E. P., **Variations of wind direction in South Wales in historic times.** *Royal Meteorological Society, Quarterly Journal*, 60:165–166, April **1934. DWB**—Information taken from records of blowing sand and dunes, showing periods of drifting sand and stable periods when dunes were fixed by vegetation, covering period from 400 B.C. to 1810 and up to present time. *Subject Headings:* **1. Surface wind variations 2. Historic weather records 3. Sand dunes 4. South Wales.**—*M.K.R.*

10A–139 551.509.8

Brooks, C. E. P., **Weather lore.** *Rambler's Handbook*, **1934**:22–25.—Discussion of prognostics of daily weather. *Subject Heading:* **1. Weather lore.**

10A–140 551.557.3(677) 551.553(677)

Brooks, C. E. P. and Durst, C. S., **The winds of Berbera.** Discussion of observations made under the supervision of R. S. Taylor, Principal Medical Officer. *Great Britain. Meteorological Office, Professional Notes*, 5(65), **1934.** 13 p. 8 figs., 4 tables, 3 refs. **DWB, DLC**—Deals first with upper winds (to 20,000 ft) 1931 and 1932. Results of pressure tube anemometer are then analyzed for seasonal and diurnal variation, with hourly tables for average wind speed and resultant wind speed and direction, May 1931–April 1933. The peculiarities are explained by a regional study of temperature. (*Same item as* 2J–145, Oct. 1951 and 4E-66, May 1953, *MAB.*) *Subject Headings:* **1. Wind variations 2. Upper air wind variations 3. Berbera, British Somaliland.**—*C.E.P.B.*

1935

10A–141 551.553.1:551.513(677)

Brooks, C. E. P. and Durst, C. S., **The circulation of air by day and night during the southwest monsoon near Berbera, Somaliland.** *Royal Meteorological Society, Quarterly Journal*, 61(259):167–177, April **1935.** 4 figs., 4 tables, 2 refs. **DWB**—The circulation in July and August cannot be accounted for by the ordinary mechanism of land and sea breezes, ranging at Berbera from 33 mph at 9 h to less than 6 mph at 20 h, extending to more than 4000 ft and to the center of the Gulf of Aden. Diurnal variations of pressure, air and sea temperature are tabulated and it is shown that there will be a rise of isobaric surfaces up to 5000 ft over the land by day, and a reversal by night. This causes the abnormal diurnal variation. There is a corresponding variation of cumuliform cloud (minimum about noon). (*Same item as* 2J–148, Oct. 1951, *MAB.*) *Subject Headings:* **1. Diurnal wind variations 2. Monsoons 3. Atmospheric circulation 4. Berbera, British Somaliland.**—*C.E.P.B.*

1936

10A–142 551.5:025.45

Brooks, C. E. P., **The classification of meteorological literature.** *Royal Meteorological Society, Quarterly Journal*, 62:134–144, Jan. **1936. DWB**—Meteorology was formerly classified according to the system used in the International Catalogue of Scientific Literature, constructed about 1895. This having become obsolete, a new classification was adopted by the International Meteorological Organization at Warsaw in 1935. The Commission for Bibliography built the new classification within the framework of the Universal Decimal Classification. This system of Classification for Meteorology is quoted in full. *Subject Heading:* **1. U.D.C. for meteorology.**—*M.K.R.*

10A–143 515.513

Brooks, C. E. P., **Recent studies of the mean atmospheric circulation.** *Meteorological Magazine* 71(845,848):105–110, 177–183, June, Sept. **1936.** 2+5 figs., 9+11 refs. Enlarged and reprinted as **Studies on the mean atmospheric circulation** in *American Meteorological Society, Bulletin*, 18(10):313–321, Oct. **1937.** 7 figs., 22 refs. **DWB**—Pt. I. deals with the mean circulation at sea level, with Mercator maps of streamlines and mean fronts in Jan. and July. Pt. II. discusses upper air data with north-south sections for West Africa and for India, North America and East Africa for Dec. to Feb. and June to Aug., to a height of 10 km. These show the sloping boundary between the polar westerly and tropical easterly winds. (The second title is the *same item as* 4E-88, May 1953, *MAB.*) *Subject Heading:* **1. Atmospheric circulation.**—*C.E.P.B.*

10A–144 551.590.21:061.3

†Brooks, C. E. P., **The relations of solar and meteorological phenomena: a summary of the results from 1925 to 1934 inclusive.** *International Council of Scientific Unions, Fourth Report of the*

Commission for the Study of Solar and Terrestrial Relationships, pub. Florence, **1936.** p. 147–154. 29 refs. **DLC**—This report discusses some papers which treat solar and terrestrial relations as more complex than the simple sunspot cycle. Several authors investigated the relations between solar changes and atmospheric pressure; some (S. HANZLIK, H. H. CLAYTON, C. J. KULLMER) found complex relations, others (C. E. P. BROOKS, S. S. VISHER) found no relation. Some relations to rainfall and thunderstorms are considered. Finally, theories of a solar cause of geological changes of climate (E. HUNTINGTON and S. S. VISHER, G. C. SIMPSON, W. H. BRADLEY, M. MILANKOVITSCH and W. KÖPPEN) are summarized. The account is summarized in French by G. ABETTI on p. 31–33. (*Same item as* 8A–15, Jan. 1957, *MAB.*) *Subject Headings:* **1. Solar influences 2. International Commission on Solar-Terrestrial Relationships.**

10A–145 515:025.45

Brooks, C. E. P., **A year's experience of the Universal Decimal Classification in meteorology.** *Meteorological Magazine*, 71:249–252, Dec. **1936. DWB**—Length of numbers no serious inconvenience. Purely meteorological part quite successful. Borderline subjects more difficult. Subject of bibliography too great for reclassification. Tables constructed for reclassification. Mechanics of writing numbers explained. *Subject Heading:* **1. UDC for meteorology.**—*M.K.R.*

1937

10A–146 551.553:902

Brooks, C. E. P., **Early wind records at Birmingham and Deal.** *Royal Meteorological Society, Quarterly Journal*, 63:207–209, April **1937. DWB**—Material taken from a manuscript weather diary kept by GEORGE BIBBY of Birmingham from 1797–1824, and cuttings from *London Magazine*, etc., giving daily observations at Deal 1747–1753. Wind records summarized in 3 tables. Table IV, Resultant winds at Deal, 1747–1753. Records for Margate, 1876–1932, included with Deal for comparison. *Subject Headings:* **1. Historic wind records 2. Birmingham, Eng. 3. Deal, Eng.** —*M.K.R.*

10A–147 551.553.3(410)

Brooks, C. E. P., **The five-year cycle in the circulation of the atmosphere over the British Isles.** *Meteorological Magazine*, 72:204 209, Oct. **1937. DWB**—Two tables: I. Calculated lengths of periodicity. II. Sine terms of 5.05 year periodicity. Three figures: 1. Combination of types IID6 and IIE. 2. 5.05 year cycle, stage $t=0$. Deviations of pressure and resultant wind from normal. 3. Variations of pressure at Edinburgh and Stykkisholm in 5.05 year cycle. *Subject Headings:* **1. Wind periodicities 2. British Isles.**—*M.K.R.*

10A–148 551.579.4(73)

Brooks, C. E. P., **The floods in the United States of America.** *Royal Meteorological Society, Quarterly Journal*, 63:181–183, April **1937. DWB**—Describes Ohio and Mississippi River Valley floods of 1937, tracing flood conditions from heavy rains during last few months of 1936 until danger was finally over in Feb. 1937. Concludes with praise for accurate forecasts of times and heights of flood stages by U. S. W. B., without which loss of life and property would have been much greater. *Subject Heading:* **1. Floods, United States (1937).**—*M.K.R.*

10A–149 551.593.63

Brooks, C. E. P., **The halo complex of April 19, 1937.** *Royal Meteorological Society, Quarterly Journal*, 63:416–418, July **1937. DWB**—Phenomena associated with a warm front. First series, began at Dublin, Fig. 1. Second series, began at Sealand, Fig. 2. One table: Halo phenomena, April 19, 1937. *Subject Heading:* **1. Halo observations.**—*M.K.R.*

10A–150 551.511.33

Brooks, C. E. P., **The unequal heating of land and water.** *Meteorological Magazine*, 72(859): 153–156, April **1937. DWB**—Discusses the relative depth and amount of absorption of solar radiation by sea and land (sand, loose soil, rock, etc.)—also the amount of convection. Compared by day and night. *Subject Heading:* **1. Heat balance.**—*M.K.R.*

1938

10A–151 551.509.33

Brooks, C. E. P., **Long-range weather forecasting.** *Meteorological Magazine*, 73(874):257–262, Nov. **1938. DWB**—Summary of methods of forecasting general weather for a month or season—correlation (SIR G. WALKER). Weather cycles, points of reflection, pressure anomalies. (*Same item as* 2A–11, Jan. 1951, *MAB.*) *Subject Heading:* **1. Long range forecasting.**—*C.E.P.B.*

10A–152 551.524.34(211.1)

Brooks, C. E. P., **The warming Arctic.** *Meteorological Magazine*, 73(866):29–32, March **1938.** **DWB**—Various possible explanations are given and discussed. Actual cause is undetermined, as with previous great climatic oscillations. Fig. 1 shows deviations of temperature from normal, Oct. 1937 to Jan. 1938. *Subject Heading:* **1. Warming of Arctic.**—*M.K.R.*

1939

10A–153 551.582(499)

Brooks, C. E. P., **The climate of Chios.** *Royal Meteorological Society, Quarterly Journal*, 65:52–56, Jan. **1939.** 5 tables. **DWB**—Data considered valuable as so little is known of the meteorology of any island in the Aegean. Previously published data covered period of 1853–56. Two series of records are now available, both kept at Chios Gymnasion: 1. 1898–1917, 2. 1928–1938. Data made available by PHILIP ARGENTI, honorary attaché of the Royal Greek Legation in London. *Subject Headings:* **1. Local climatology 2. Chios.**—*M.K.R.*

10A–154 551.583.7

Brooks, C. E. P., **Climatic changes.** *Meteorological Magazine*, 74(879):65–71, April **1939.** 10 refs. **DWB**—One table, Geological formations, lists geological periods, their geographical conditions, and the climate of the middle latitudes. Various conflicting opinions are discussed and conclusion is that the problem of climatic changes is still unsolved. *Subject Heading:* **1. Geological climates.**—*M.K.R.*

10A–155 551.590.21:061.3

†Brooks, C. E. P., **The relations of solar and meteorological phenomena: a brief summary of the results from 1936 to 1938.** *International Council of Scientific Unions, Fifth Report of the Commission for the Study of Solar and Terrestrial Relationships*, pub. Florence, **1939.** p. 196–199. 17 refs. **DLC**—Brief summaries of 17 papers on solar variations, relations with atmospheric pressure, circulation and air masses, climate of Canada, droughts, tree rings and halos. (*Same item as* 8A–21, Jan. 1957, *MAB.*) *Subject Heading:* **1. Solar influences.**

1941

10A–156 551.593.63

Brooks, C. E. P., **The halo display of March 6, 1941.** *Royal Meteorological Society, Quarterly Journal*, 67:292–294, July **1941.** **DWB**—Summary of reports on this unusually complete halo display. Two figures: 1, Halo phenomena observed at Tern Hill, Shropshire; 2, Halo phenomena at Stonehouse, Glos. Whole display notable for prodigal number of mock suns and for the presence of some rarely seen arcs. *Subject Headings:* **1. Halo observations 2. British Isles.**—*M.K.R.*

1943

10A–157 551.501.45:551.524.32

Brooks, C. E. P., **Interpolation tables for daily values of meteorological elements.** *Royal Meteorological Society, Quarterly Journal*, 69(300):160–162, April **1943.** table. **DWB**—Gives a method of calculating daily value, or date of occurrence of any given value, from monthly means on the assumption that 3 successive months can be represented by a sine curve with annual period. (*Same item as* 2D–73, April 1951, *MAB.*) *Subject Heading:* **1. Interpolation.**—*C.E.P.B.*

1945

10A–158 551.508.41:551.542(261)

Brooks, C. E. P., **Systematic errors in the mean pressure over the North Atlantic.** *Royal Meteorological Society, Quarterly Journal*, 71:141–143, Jan.–April **1945.** **DWB**—Sources of errors: 1. Suction effect of wind passing over a ship on air in interior. 2. "Pumping" of barometer due to rolling of ship. 3. Tendency of ships to spend a disproportionate amount of time passing through areas of rough sea associated with depression. 4. (possibly) Relative motions of ships and depressions. Mean pressures tend to be too low. *Subject Heading:* **1. Barometer errors.**—*M.K.R.*

1946

10A–159 551.583.13(4,410)

Brooks, C. E. P., **Annual recurrences of weather; "singularities." Pt. 1–2.** *Weather*, 1(4,5): 107–113, 130–134, Aug., Sept. **1946.** 4 figs., table. **DWB**—Gives curves of mean daily pressure at Kew, 1881–1940, frequency of "anticyclonic" and "stormy" days over British Isles 1889–1940,

and selects 23 "singularities" of pressure which occurred in 22 to 52 out of 52 years. In Pt. 2. the singularities of the cold period of mid-February, the beginning of the European summer monsoon, the September anticyclones, the stormy period of late November and early December and the "post-Christmas depression" are selected for more detailed description. *Subject Headings:* **1. Singularities 2. Weather forecasting 3. British Isles 4. Europe.**—*C.E.P.B.*

10A–160 551.58:620.19

Brooks, C. E. P., **Climate and the deterioration of materials.** *Royal Meteorological Society, Quarterly Journal,* 72(311):87–97, Jan. **1946.** 3 figs., 2 tables, 8 refs. **DWB**—A discussion of effects of heat and moisture on materials. The maximum temperature taken up by a body exposed to the sun is calculated for different latitudes and for surfaces of different colors. Effects of temperature in speed of chemical action, viscosity and organic action are considered. Combined deterioration index of temperature t°C and relative humidity H is represented by $\Sigma 1.054^{t}(H-65)/10$ and a world map given. (*Same item as* 5J–51, Oct. 1954, *MAB.*) *Subject Headings:* **1. Climatic effects 2. Deterioration of materials 3. Industrial climatology.**—*C.E.P.B. & G. J. Evans.*

10A–161 551.501.7:551.557

Brooks, C. E. P.; Durst, Charles S. and Carruthers, Nellie, **Upper winds over the world. Pt. I. The frequency distribution of winds at a point in the free air.** *Royal Meteorological Society, Quarterly Journal,* 72(311):55–73, Jan. **1946.** 9 figs., 16 tables, 8 eqs. **DLC**—It is shown by several examples that individual winds are distributed about the vector mean in accordance with the normal law of errors. The "scatter" is measured by the "constancy" $q=100Vr/Vs$ (Vr=resultant, Vs=scaler mean velocity). Instructions and tables are given for calculating frequency distribution per mille for values of q from 80 to 0. (*Same item as* 4E–139, May 1953 and 7A–122, Jan. 1956, *MAB.*) *Subject Headings:* **1. Upper air wind computation 2. Upper air winds 3. Upper air wind roses.** —*C.E.P.B.*

1947

10A–162 551.510.42:551.591(42)

Brooks, C. E. P., **Atmospheric pollution in Great Britain in relation to the burning of coal.** *National Smoke Abatement Society, Proceedings of the Edinburgh Conference,* p. 98–106, **1947.** 7 figs., table. **DWB**—A map of the total solid deposits recorded by pollution gages over Britain is compared with consumption of coal and frequency of poor visibility. Pollution deposits are mapped for Glasgow and Manchester and a section W–E across London shows relation between pollution and winter sunshine. (*Same item as* A–174, Jan. 1950, 3G–201, March 1952 and 3I–189, Sept. 1952, *MAB.*) *Subject Headings:* **1. Atmospheric pollution 2. Visibility 3. Great Britain.**—*C.E.P.B.*

10A–163 551.506:519.2

Brooks, C. E. P., **The numerical basis of climate, Pt. 1–3.** *Meteorological Magazine,* 76:9–14; 36–42;56–59, Jan.–March, **1947. DWB**—Pt. 1, **The significance of averages,** has two tables: I. Temperature (°F) frequency per 10 yrs at 1300 in April, and II. Mean, quartiles, deciles, median, mode for Scilly and Birmingham; and two figures: 1. Frequency distribution 1300 temperature, Scilly, April. 2. Frequency histogram 1300 temperature, Birmingham, April. Pt. 2, **Frequency curves,** has two tables: I. Normal frequency distribution; II. Calculation of a normal frequency curve; and three figures: 1. Observed and computed frequencies of temperature at Scilly, April, 1300, 1928–37; 2. Frequency distribution, annual rainfall, Glenquoich; 3. Number of days exceeding various amounts of rain at Kilmarnock. Pt. 3, **Significance tests and the analysis of variance,** has one table: Haloes and subsequent precipitation. *Subject Heading:* **1. Statistical methods in climatology.**—*M.K.R.*

10A–164 551.583.7

Brooks, C. E. P., **Unsolved problem of climatic change.** *Meteorological Magazine,* 76:126–129; 147–151, **1947.** 2 tables, 9 refs. **DWB**—Pt. I. Facts, sets out climates of geological formations, including ice ages and pluvial periods. Pt. II. Theories, discusses five broad classes: variations of solar radiation; changes in the elements of the earth's orbit; movements of the continents relative to the poles and to each other; changes in the constitution of the earth's atmosphere; and changes in the configuration of the earth's surface. None of these is entirely satisfactory and all remain unproved. *Subject Headings:* **1. Paleoclimates 2. Climatic change theories.**—*C.E.P.B.*

1948

10A–165 551.585

Brooks, C. E. P., **Classification of climates.** *Meteorological Magazine,* 77:97–101, **1948.** fig., 7 refs. **DWB**—Discussion of various methods of classification, especially that of C. W. THORN-

THWAITE, with application to Richmond, Surrey. *Subject Headings:* **1. Climatic classifications 2. Thornthwaite's classification.**—*C.E.P.B.*

1949

10A–166 551.583.3 551.586

Brooks, C. E. P., **Causes of climatic fluctuations.** *Royal Meteorological Society, Quarterly Journal*, 75:172–174, April **1949. DWB**—Discusses various theories as to causes of climatic fluctuations. Divides post-glacial time into three main divisions: 1. A period of extreme continental climate, 2. Post-glacial climatic optimum, 6000 B.C.–3000 B.C., 3. Subboreal. *Subject Heading:* **1. Postglacial climates.**—*M.K.R.*

10A–167 551.553.6:551.556.3

Brooks, C. E. P., **Frequency of winds between given velocities.** *Meteorological Magazine*, 78:33–36, Feb. **1949. DWB**—Table I. Observed and calculated frequencies of winds, 12.5–31.5 mph; Fig. 1. Duration of winds between 12.5 and 31.5 mph; Fig. 2. Relative efficiency of winds. *Subject Headings:* **1. Wind frequencies 2. Windmills.**—*M.K.R.*

10A–168 551.583.2:551.513.1

Brooks, C. E. P., **Post-glacial climatic changes in the light of recent glaciological research.** *Geografiska Annaler*, 31(1/4):21–24, **1949. DLC**—Author shows that during periods of general advance of glaciers since 14th century, winds in England were variable, but during periods of retreat they were south-westerly and steady. Advection of warm air causes retreat. Hypothesis is advanced that the "pool" of cold air over Arctic ice cap plays no direct part in atmospheric circulation but by displacing Arctic front causes advanced or withdrawn positions of ice cap to be persistent. (*Same item as* 6–89, June 1950, *MAB.*) *Subject Headings:* **1. Climatic changes 2. Historical climates 3. Atmospheric circulation.**—*C.E.P.B.*

1950

10A–169 551.583.3:551.311.184:551.513

Brooks, C. E. P., **Climatic fluctuations and the circulation of the atmosphere.** *Weather*, 5(3):113–119, March **1950.** 2 figs., 2 photos, 4 refs. **DWB**—Distinguishes 5 stages in fluctuations of glaciers: 1. From 7th to 10th centuries, small, little ice, rainfall below average; 2. 11th to 15th centuries Arctic ice increased, very stormy; 3. 16th to mid-17th centuries, glaciers advanced rapidly; 4. 1650–1850, "Little Ice Age," maxima 1650, 1750 and 1850; 5. 1850 to present, retreat of glaciers. Effect of Arctic ice cap on atmospheric circulation discussed, including high and low zonal index. Conditions are stable within limits, but if changes are unchecked they may change permanently. (*Same item as* 5–88, May 1950 and 5I–163, Sept. 1954, *MAB.*) *Subject Headings:* **1. Postglacial climates 2. Arctic ice changes 3. Atmospheric circulation 4. Historical climates 4. North Atlantic Region.**—*C.E.P.B.*

10A–170 551.576(410)

Brooks, C. E. P., **Cloud phenomenon near Ferring, Sussex, May 14, 1950.** *Meteorological Magazine*, London, 79(939):266, Sept. **1950.** Sketch. **DWB**—Small spiral cloud in otherwise clear dry air. (*Same item as* 2.1–133, Jan. 1951, *MAB.*) *Subject Headings:* **1. Clouds 2. England.**

10A–171 551.583.3

Brooks, C. E. P., **Legacy of the Ice-age.** *Meteorological Magazine*, London, 79(941):321–323, Nov. **1950.** 2 refs. **DWB**—Review of "Pleistocene Research" report of the Committee of Interrelations of Pleistocene Research (*Geological Society of America, Bulletin*, 60, **1949**). (*Same item as* 2.6–126, June 1951, *MAB.*) *Subject Headings:* **1. Climatic changes 2. Glacial periods.**—*C.E.P.B.*

10A–172 551.577.22

Brooks, C. E. P., **Relation between number of days with 0.4 in. or more of rain and total rainfall.** *Meteorological Magazine*, London, 79(935):152–153, May **1950.** table. **DWB**—Note on article by E. V. NEWNHAM (*Meteorological Magazine*, Jan. **1950**). Days with 0.4 in. or more = Rainfall (in.) $-c$, where c varies from 6 to 12. Correlation coefficients 0.98. In British Isles, days with 0.2 in. or more $= 1.5R + 6$. (*Same item as* 7–90, July 1950, *MAB.*) *Subject Heading:* **1. Rainfall distribution.**

10A–173 551.583.3:016

†Brooks, C. E. P., **Selective annotated bibliography on climatic changes.** *Meteorological Abstracts and Bibliography*, Boston, 1(7):446–475, July **1950.** 201 refs. **DLC, DWB**—The 201 annotated references are arranged in chronological order under the following sections: I. General,

and theories of the cause of climatic change; II. Climatic changes in geological time, including the Quaternary Ice Age; III. Climatic changes in the Post-glacial and Historical Periods; IV. Climatic changes shown by instrumental meteorological observations (roughly since A.D. 1700). The various aspects of the subject covered in the bibliography are indicated in an outline. An outline of geographic areas is also included. *Subject Heading:* **1. Climatic change bibliographies.**—*M.L.R.*

1951

10A–174 551.583.2

†Brooks, C. E. P., **Geological and historical aspects of climatic change.** (In: **Compendium of meteorology.** Boston, American Meteorological Society, **1951.** p. 1004–1018. 4 figs., 4 tables, 36 refs.) **DWB**—This review of geological and historical climatic changes covers the following aspects: the world climates that prevailed during most of geological time (Jurassic, Eocene climates); the extent of and temperatures during the Quaternary Ice Age, and the pluvial periods during this Ice Age: the earlier ice ages, namely, during the Palaeozoic and Proterozoic Ice Ages; post-glacial climatic changes; the climatic changes during the Christian era; and the various theories of climatic changes which depend upon 1) variations of solar radiation, 2) changes in obliquity and eccentricity of the earth's orbit, 3) tidal variations, 4) continental drift, 5) variations in carbon dioxide, 6) volcanic dust in the atmosphere, 7) topographic variations, 8) geographical factors and 9) a combination of changes in solar radiation and topography. (*Same items as* 3.9–3, Sept. 1952, *MAB.*) *Subject Headings:* **1. Climatic changes 2. Historical climates 3. Quaternary climates 4. Compendium articles.**—*I.L.D.*

10A–175 551.583:551.513.1

Brooks, C. E. P., **Geological climates in the light of modern meteorology.** *Weather,* 6(8):237–241, Aug. **1951.** 13 refs. **DWB**—Brief discussion of the development of the Quaternary Ice Age in terms of recent research on the heat balance and circulation of the atmosphere and the circulation of the oceans. (*Same item as* 3.3–212, March 1952, *MAB.*) *Subject Headings:* **1. Geological climates 2. Atmospheric circulation.**—*C.E.P.B.*

10A–176 551.583(26)

Brooks, C. E. P., **Oceans through the ages.** *Marine Observer,* 21(152):103–110, April **1951.** 2 figs., tables. **DWB**—Brief description of origin and history of the oceans, ocean currents and weather of warm periods and of Quaternary and Permo-Carboniferous ice ages. Ends with an account of ocean changes in Post-glacial. (*Same item as* 2.10–160, Oct. 1951 and 5A–174, Jan. 1954, *M.A.B.*) *Subject Headings:* **1. Climatic changes 2. Oceans.**—*C.E.P.B.*

10A–177 551.590.21

Brooks, C. E. P., **The relations of solar and meteorological phenomena.** *International Council of Scientific Unions, Seventh Report of the Commission for the Study of Solar and Terrestrial Relationships,* **1951.** p. 183–198. table, 44 refs. **DWB**—Mechanism of established sunspot temperature cycle is discussed, including effect of large variation of UV radiation. Relations between ozone, pressure and temperature are examined and speculative effects of solar corpuscular radiation on weather considered. Relations between sunspots and pressure, temperature, precipitation and thunderstorms are summarized and their origins (UV or corpuscular radiation) discussed. Short period relations between sunspots and weather are examined with special reference to frequency of thunder. (*Same item as* 3.7–198, July 1952, *MAB.*) *Subject Heading:* **1. Sunspot effects.**—*C.E.P.B.*

10A–178 551.501:016

†Brooks, C. E. P., **Selective annotated bibliography on constants, units, tables and diagrams.** *Meteorological Abstracts and Bibliography,* Boston, 2(4):289–318, April **1951.** 200 refs. **MH-BH**—An annotated bibliography of 200 references arranged chronologically under the following: A. Constants, Units and General Works; B. Tables for Conversion and Reduction and C. Computing Diagrams, Nomograms, Slide Rules. A detailed prefatory outline is a guide to specific subjects covered. *Subject Headings:* **1. Bibliography on aids to computation 2. Bibliography on physical constants.**—*M.L.R.*

10A–179 551.509.33:016

†Brooks, C. E. P., **Selective annotated bibliography on general and extended forecasting.** *Meteorological Abstracts and Bibliography,* Boston, 2(1):42–67, Jan. **1951.** 153 refs. Also his **Selective annotated bibliography on long range forecasting.** *Ibid.,* 2(2):124–157, Feb. **1951.** 225 refs. **DWB**—The two bibliographies contain a total of 378 annotated references. Sec. I. of the first bibliography is devoted to general works on methods of forecasting for periods exceeding two days; Sec. II. contains works dealing with periods from three days to less than a month. The second

bibliography deals with periods from one month upwards. The subject outlines prefacing each bibliography indicate the various bases and methods or schools of thought represented and the types of phenomena forecast. The continents or regions involved are listed in the geographical outlines. Items are arranged chronologically. (*Same item as* 6B–92, Feb. 1955, *MAB.*) *Subject Headings:* **1. Extended forecasting bibliographies 2. Long range forecasting bibliographies.**—*C.E.P.B.*

10A–180 551.5:551.43:016

†Brooks, C. E. P., **Selective annotated bibliography on mountain meteorology.** *Meteorological Abstracts and Bibliography*, Boston, 2(11):916–959, Nov. **1951.** 267 refs. **DWB**—The physical, rather than the physiological, factors are emphasized in this annotated bibliography of 267 references dealing with various aspects of mountain meteorology. A detailed subject outline indicates that papers deal with (a) the effects of elevation on meteorological elements and (b) effects of mountain conditions on observations, instruments and observatories. A geographic outline indicates the areas covered by the bibliography. The arrangement is chronological. (*Same item as* 6B–93, Feb. 1955, *MAB.*) *Subject Heading:* **1. Mountain meteorology bibliographies.**—*M.L.R.*

1952

10A–181 551.584.2

Brooks, C. E. P., **A proposed regional climatic survey.** *Meteorological Magazine*, London, 81(956):59–60, Feb. **1952.** ref. **DWB**—Comments on paper by K. Knoch (**Über das Wesen einer Landesklimaaufnahme.** *Zeitschrift für Meteorologie*, 5(5–6):173–177, May–June **1951**) and possibilities in Britain. (*Same item as* 3.9–209, Sept. 1952, *MAB.*) *Subject Headings:* **1. Climatic surveys 2. Local climates. I. Knoch, K.**—*C.E.P.B.*

10A–182 551.588.7:016

†Brooks, C. E. P., **Selective annotated bibliography on urban climates.** *Meteorological Abstracts and Bibliography*, Boston, 3(7):734–773, July, **1952.** 249 refs. **DWB**—An annotated bibliography of 249 references to literature containing a) data on climates of towns and cities, and dealing with b) the effect of towns on meteorological elements and phenomena, c) the effect of climatic factors on town planning and architecture and d) the effects of urban conditions on health. An outline indicates the detailed aspects of the subject covered in the bibliography. References are arranged chronologically (earliest imprint, 1833). *Subject Heading:* **1. Urban climatology bibliographies.**—*M.L.R.*

1953

10A–183 551.509.33:551.521.13

Brooks, C. E. P., **Forecasting weather from solar radiation.** *Nature*, London, 172(4389):1089–1090, Dec. **12, 1953.** 2 refs. **DWB**—Review of two papers by C. G. Abbot (*Smithsonian Miscellaneous Collections*, 122, Nos. 1, 4) and comparison of forecast and observed temperatures at Washington, Jan. 1952 to July 1953. (*Same item as* 5.6–74, June 1954, *MAB.*) *Subject Headings:* **1. Long range forecasting 2. Solar constant. I. Abbot, C. G.**—*C.E.P.B.*

10A–184 551.524.32(42)

Brooks, C. E. P., **The January thaw in New England, the January frost in Britain.** *American Meteorological Society, Bulletin*, 34(5):224–225, May **1953.** 4 figs. **DWB**—The temperature changes in Jan. in Europe, the first singularity of the year, are described with the aid of synoptic charts. In view of the difficulties inherent in statistical tests for the reality of singularities the author proposes a synoptic approach which is illustrated by a hypothetical example. This note was occasioned by Eberhard W. Wahl's **The January thaw** in *A.M.S., Bulletin*, 33(9):380–386, Nov. **1952.** (*Same item as* 6.6–228, June 1955, *MAB.*) *Subject Headings:* **1. Temperature singularities 2. January thaw 3. New England 4. Great Britain.**—*I.L.D.*

10A–185 551.583

Brooks, C. E. P., **What is happening to the weather?** *Harper's Magazine*, 206(1232):32–39, Jan. **1953. DLC**—Climatic changes of the past century—milder winters and hotter drier summers—and their social, biological and glaciological effects are summarized, and related to climatic variations since the Ice Age. The cause of worldwide temperature changes is sought in self-maintaining variations of the atmospheric circulation. The possible effects of increased fuel consumption are considered and the future outlook is discussed. (*Same item as* 4.6–202, June 1953, *MAB.*) *Subject Headings:* **1. Climatic changes 2. Climatic trends.**—*C.E.P.B.*

1954

10A–186 551.5:6:016

†Brooks, C. E. P. and Evans, G. J., **Annotated bibliography on industrial meteorology.** *Meteorological Abstracts and Bibliography*, Boston, 5(10):1187–1230, Oct. **1954.** 235 refs. **DWB**—References to a representative selection of works dealing with the various ways in which meteorology and climatology affect industry and commerce. The 235 references are annotated and are arranged chronologically under six sub-headings. Various aspects of the subject are indicated in an outline. *Subject Heading:* **1. Industrial meteorology bibliographies.**—*M.L.R.*

10A–187 551.583.2

Brooks, C. E. P., **The climatic changes of the past thousand years.** *Experientia*, Basel, 10(4): 153–158, April 15, **1954.** 9 figs., 13 refs. French summary p. 158. **DLC**—Various lines of evidence of climatic changes in the temperate Northern Hemisphere since 1000 A.D. indicate: 1) a mild dry period 1000–1250 A.D.; 2) rainier, stormy weather 1250–1400; 3) colder but less stormy 1400–1600; 4) the "Little Ice Age" 1600–1850; 5) progressive warming 1850 to present day. The changes are attributed to changes in the zonal atmospheric circulation and in the distribution of floating sea ice. (*Same item as* 5.7–183, July 1954, *MAB.*) *Subject Headings:* **1. Historical climates 2. Climatic changes.**—*C.E.P.B.*

10A–188 551.583.13

Brooks, C. E. P., **On month to month persistence and on 7-day periodicity.** *American Meteorological Society, Bulletin*, 35(7):314, Sept. **1954. DWB**—The author presents a table giving correlation coefficients between surface pressure in successive months and indicating some real month to month persistence, which is attributed to the persistence of variations in the area of Arctic ice from month to month and its influence upon pressure distribution. Also 7-day periodicities are real and their length represents the life-time of a Bjerknes family of depressions with the intervening anticyclones. (*Same item as* 6.7–310, July 1955, *MAB.*) *Subject Headings:* **1. Persistence 2. Periodicities 3. Seven-day periodicities.**—*I.L.D.*

1955

10A–189 025.4:551.5

Brooks, C. E. P.; Rigby, Malcolm and Schraitle, Winifred, **Alphabetical list of subject headings with corresponding Universal Decimal Classification numbers for Meteorology (551.5) and related subjects.** Based on Volumes I–V of *Meteorological Abstracts and Bibliography*, Jan. 1950–Dec. 1954. Washington, D. C., Dec. **1955.** 120 p. **DWB** (M(016) A512a)—This list covers meteorology and related subjects, U.D.C. numbers being assigned to the alphabetical subject headings wherever possible. The Introduction includes the principles of assignment of U.D.C. numbers, arrangement of subject headings and cross-referencing. *Subject Headings:* **1. Subject headings for meteorology 2. U.D.C. for meteorology.**—*C.E.P.B.*

10A–190 551.583

Brooks, C. E. P., **Present position of theories of climatic change.** *Meteorological Magazine*, London, 84(997):204–206, July **1955.** 19 refs. **DWB**—Recent literature on the causes of climatic change is discussed. Variations of solar radiation are now first favorite but the problem is still unsolved. (*Same item as* 6.10–243, Oct. 1955, *MAB.*) *Subject Heading:* **1. Climatic change theories.**—*C.E.P.B.*

10A–191 551.584.6:016

†Brooks, C. E. P. and Evans, G. J., **Annotated bibliography on the climate of enclosed spaces (cryptoclimates).** *Meteorological Abstracts and Bibliography*, 7(2):211–264, Feb. **1956.** 282 refs. **DLC, DWB**—An annotated bibliography of 282 items on cryptoclimates. The emphasis is on the "relationship between various meteorological elements and the climate of enclosed or semi-enclosed spaces, particularly those occupied by men or animals." The "subject outline gives some idea of the variety and scope of subjects that are embraced by the field of cryptoclimatology." A geographic index is also included. *Subject Headings:* **1. Cryptoclimatology bibliographies 2. Bibliography on climate of enclosed spaces.**—*From authors' introduction.*

10A–192 551.506.2(410):551.574.42

§Brooks, C. E. P. and Douglas, C. K. M., **Glazed frost of January 1940.** *Great Britain. Meteorological Office, Geophysical Memoirs*, No. 98, **1956.** 38 p. 5 figs., charts, 11 plates, 5 tables, 12 refs. At head of t.-p. M.O. 584f. **DWB**—This memoir describes an occurrence probably unique in Britain. Pt. I. summarizes the phenomena with daily maps from Jan. 27–Feb. 3 and numerous photos, and relates them to the surface temperature distribution. Pt. 2 describes the

synoptic developments, with a series of synoptic charts. These show two belts of precipitation on fronts at the eastern edge of a south to south-west flow held up over southwest Britain by a cold south-east current with a large cross-isobaric component. The period Jan. 26–30 is analyzed in detail including upper winds which show the important part played by ageostrophic motion. (*Same item as* 7.10–7, Oct. 1956, *MAB.*) *Subject Headings:* **1. Glazed frost 2. Great Britain.**—*C.E.P.B.*

1957

10A–193 551.590.21:016

†Brooks, C. E. P., **Annotated bibliography on solar relations with weather.** *Meteorological Abstracts and Bibliography*, 8(1):95–119, Jan. **1957.** 117 refs. **DWB**—This is a continuation of previous work (*see* 8A–1, Jan. 1957 and 10A–76) on the subject and covers period 1924–1957. The bibliography contains 117 items and the subject matter is divided into five sections: 1. General, 2. Temperature, 3. Pressure, storminess and winds, 4. Rainfall, river and lake levels and 5. Cloud, thunderstorms and atmospheric electricity. *Subject Headings:* **1. Solar relationships 2. Bibliography on solar-weather relationships.**—*M.K.R.*

ANONYMOUS CONTRIBUTIONS

10A–194 551.506.1

*Great Britain. Meteorological Office, **Réseau Mondial 1910–1934. Monthly and annual summaries of pressure, temperature and precipitation based on a world-wide network of observing stations.** London, H.M.S.O., **1917–1956.** 25 v. about 116 p. each v. mostly tables. At head of t.-p M.O. 597, M.O. 598. **DWB**—One of the most consistent and comprehensive sources of data for calculation of global distributions of the common meteorological elements, their normal values, anomalies and seasonal or year-to-year variations. The stations are selected so as to form a network with two stations for each 10° square of latitude and longitude over land areas. Values for ocean squares were first included in the 1921 volume. The project was sponsored by the International Meteorological Committee and by Sir Napier Shaw, who turned over the execution of the organization, compilation, and editing to C. E. P. Brooks. (*Same item as* 3C–13, March 1952, 5A–95, Jan. 1954 and 8.7–116, July 1957, *MAB.*) *Subject Headings:* **1. Réseau Mondial 2. Climatic data for world 3. World.**—*M.R.*

10A–195 551.5:016

†Royal Meteorological Society, London, **Bibliography of Meteorological literature. . . .** London, Royal Meteorological Society, [1922]–**1950.** 6 v. **DWB, DLC**—A continuation of the bibliography of meteorological works received in the Royal Met. Soc. and the British Met. Office Libraries, which was published in the *Royal Met. Soc., Quarterly Journal* from Jan. 1917 to Oct. 1920. The bibliography was issued every six months, and the material was arranged according to the classification scheme of the *International Catalogue of Scientific Literature* (*F. Meteorology*) up to 1935, and according to the Universal Decimal Classification (U.D.C.) from 1936 on. About 31,000 articles and books are included in this series. (*Same item as* 5C–164, March 1954 and 6A–3, Jan. 1955, *MAB.*) *Subject Headings:* **1. Meteorology bibliographies 2. U.D.C. bibliographies.**—*C.E.P.B.*

PART III. REVIEWS, RECENT MONOGRAPHS, AND ANALYTICS FROM SERIALS AND COLLECTED WORKS

Note: Material listed in these sections will not be included in the monthly indexes until abstracted. The item number is mentioned for those titles which have been abstracted in previous issues of **Meteorological Abstracts and Bibliography.**

A. REVIEWS OF IMPORTANT METEOROLOGICAL MATERIAL

Advances in Geophysics, Vol. 4, ed. by H. E. Landsberg and J. Van Mieghem. N. Y., Academic Press, 1958. 456 p. tables, figs., eqs. Review by S. A. Korff in *Physics Today*, Vol. II, No. 9, Sept. 1958. Review in *Geofisica e Meteorologia*, Genoa, Vol. 6, No. 1/2, 1958. (*For abstract on the original, see* 9.9–2, Sept. 1958, *MAB*)

Angola. Serviço Meteorológico: **Miscelanea geofísica publicada pelo Serviço meteorológico de Angola em comemoração do X anniversario.** Luanda, 1956. 366 p. figs., tables, refs. Review by O. Bultrini in *Rivista di Meteorologia Aeronautica*, Rome, 18(3):72, July/Sept. 1958.

Beer, Arthur (ed.): **Vistas in astronomy.** London, Pergamon Press, 1955. 2 vol. figs., tables, refs., bibliogs., eqs. Review by H. H. Voigt in *Die Naturwissenschaften*, Berlin, 45(17):421, Sept. 1, 1958.

Brauckhoff, Helmut: **Physik des Haares.** [Physics of hair.] Beiträge zur Haut-, Haar- und Fellkunde, Vol. 7, Koblenz [Verlag Dr. Schöps], 1958. 127 p. figs. Price 18 DM. Review by H. Troeger in *Meteorologische Rundschau*, Berlin, 11(3):104, May/June 1958.

Burger, W.: **Radar observer's handbook for merchant navy officers.** Glasgow, Brown, Son and Ferguson, 1957. 155 p. Price 16 sh. Review by C. E. N. Frankcom in *Marine Observer*, 28(181):155–156, July 1958.

Conference on the Physics of Cloud and Precipitation Particles, Woods Hole Oceanographic Institution, Sept. 7–10, 1955: **Artificial Stimulation of rain: Proceedings of the First Conference.** Pergamon Press, 1957. 427 p. figs., tables, refs., eqs. Price: $15.00. Review by B. C. V. Oddie in *Weather*, 13(6):206, June 1958. Review by Conrad P. Mook in *American Geophysical Union, Transactions*, 39(6):1172–1173, Dec. 1958. (*See* 9.4–3, April 1958, *MAB*)

B. RECENT MONOGRAPHS

Anderson, William W. and Gehringer, Jack W.: **Physical oceanographic, biological, and chemical data, South Atlantic coast of the United States,** ***M/V Theodore N. Gill Cruise 4.*** *U. S. Fish and Wildlife Service, Special Scientific Report—Fisheries*, No. 234, Dec. 1957. 192 p. 19 figs., tables. Available **DWB** (639.206 U583sp)

Ayton, Mauree W.; Shea, James E. and Brown, Clement R.: **Cold weather operation of diesel engines: a bibliography, Pt. 2.** Wash., D. C., Library of Congress, Technical Information Division, Jan. 1958. 145 p. "Pt. 1, covering published literature, was issued Sept. 1952." Available **DWB** (016.U58c)

Berggren, R.; Gibbs, W. J. and Newton, C. W.: **Observational characteristics of the jet stream: a survey of the literature.** Report of a working group of the WMO Commission for Aerology. [*World Meteorological Organization, WMO* [*Publication*], No. 71. TP. 27; Technical Note, No. 19, 1958. 102 p. figs., photos, bibliog.

Bertram, George Colin: **Arctic and Antarctic: a prospect of the Polar regions.** Cambridge, W. Heffer, 1958. 123 p. photos, map. "2d ed. of 1939 publication, **Arctic and Antarctic: the technique of polar travel."** Available **DWB** (919.8 B549ar)

Boatright, Mody C.; Hudson, Wilson M. and Maxwell, Allen (eds.): **Madstones and twisters.** *Texas Folklore Society, Publications*, No. 28 (pub. by Southern Methodist University Press, Dallas), 1958. 169 p. Available **DWB** (398 B662ma).

Boll, R. H.; Leacock, J. A.; Clark, G. C. and Churchhill, S. W.: **Tables of light-scattering functions: relative indices of less than unity, and infinity.** Ann Arbor, Michigan, Univ. of Michigan

Press, published for the Engineering Research Institute, 1958. 360 p. Almost entirely tables. 14 refs.

Boudouris, G.: **Propagation troposphérique** [Tropospheric propagation]. Paris, Centre de Documentation Universitaire, 1957. 463 p., numerous figs., and eqs. Bibl. pp. 459–463.

Bowen, R. N. C.: **The exploration of time.** N. Y., Philosophical Library, 1958. 143 p. 40 figs., 4 refs.

Briault, E. W. H. and Hubbard, J. H.: **Introduction to advanced geography.** London, Longmans, Green, 1957. 470 p. 221 figs. Numerous tables and refs. Available **DWB** (910 B849in)

Bürger, Kurt: **Zur Klimatologie der Grosswetterlagen: ein witterungsklimatologischer Beitrag** [Climatology of large scale weather situations: a contribution to synoptic climatology]. *Germany. Deutscher Wetterdienst, Bericht,* 6(45):1958. 79 p. 2 figs., 36 tables, numerous tables in appendix.

C. METEOROLOGICAL ARTICLES APPEARING IN RECENTLY ISSUED PUBLICATIONS

Air University Quarterly Review, Wash., D. C., Vol. 10, No. 2, 1958

Ogle, Dan C.: **The threshold of space,** p. 2–6

Strughold, Hubertus: **From aviation medicine to space medicine,** p. 7–16

Flickinger, Don D.: **Air Force human-factors program for developing manned space operations,** p. 17–28

Strughold, Hubertus: **Basic factors in manned space operations,** p. 29–46

Stapp, John P.: **Biodynamics of manned space flight,** p. 47–52

Clamann, Hans G.: **The engineered environment of the space vehicle,** p. 53–64

Simons, David G.: **Observations in high-altitude, sealed-cabin balloon flight,** p. 65–88

Hauty, George T.: **Human performance in the space travel environment,** p. 89–107

Sells, S. B. and Berry, Charles A.: **Human requirements for space travel,** p. 108–120

Akademiia Nauk SSSR, Izvestiia, Ser. Geofiz., No. 9, Sept. 1958

Riznichenko, Iu. V.: **Ob izuchenii seĭsmicheskogo rezhima,** [On the study of the seismic regime], p. 1057–1074

Balavadze, B. K. and Tvaltvadze, G. K.: **Stroenie zemnoĭ kory v Gruzii po geofizicheskim dannym,** [The structure of the earth's crust in Georgia according to geophysical data], p. 1075–1084

Latynina, L. A.: **Teplovaia konvektsiia v obolochke Zemli,** [Thermal convection in the earth's envelope], p. 1085–1098

Kachalov, V. P.; Pavlenko, N. A. and Iakovleva, A. V.: **Ul'trafioletovyĭ spektr Solntsa v oblasti 2471–2635 Å,** [Ultraviolet solar spectrum in the region from 2471–2635 Å], p. 1099–1104

Ivanov-Kholodnyĭ, G. S.: **Spektrofotometricheskoe izmerenie liniĭ izlucheniia Mg II v spektre Solntsa,** [Spectrophotometric measurement of the Mg II emission lines in the solar spectrum] p. 1105–1110

Bonchkovskiĭ, V. F.: **Deformatsii zemnoĭ poverkhnosti, predvariaiushchie i soprovozhdaiushchie katastroficheskie zemletriaseniia,** [Deformations of the earth's surface preceding and accompanying catastrophic earthquakes], p. 1111–1113

Kondorskaia, N. V. and Postolenko, G. A.: **Seĭsmicheskaia aktivnost' Kurilo-Kamchatskoĭ oblasti za 1954–1956 gg.,** [Seismic activity in Kurile-Kamchatka Oblast during 1954–1956], p. 1114–1120

Pasechnik, I. P.: **Seĭsmicheskie i vozdushnye volny, voznikshie pri izverzhenii vulkana Bezymiannyĭ 30 marta 1956g.,** [Seismic and air waves that formed during the eruption of Bezymiannyĭ Volcano on March 30, 1956], p. 1121–1126

Matveev, B. K.: **K metodike opredeleniia skorosti podzemnogo potoka po odnoĭ skvazhine,** [On the method of determining the speed of underground flow by a single borehole], p. 1127–1132

Piskunov, L. I.: **O kolichestvennoĭ zavisimosti mezhdu dielektricheskoĭ pronitsaemost'iu i udel'nym elektrosoprotivleniem gornykh porod,** [On the quantitative relation between the dielectric permeability and specific electric resistivity of rock], p. 1133–36

Tabulevich, V. N.; Struk, E. V. and Brandt, S. B.: **Avtomaticheskiĭ priem signalov vremeni seĭsmostantsieĭ "Makhachkala,"** [Automatic reception of time signals at the "Makhachkala" Seismic Station], p. 1137–1138

Tareev, B. A.: **Statsionarnyĭ vetrovoĭ nagon i tsirkuliatsiia v priamougol'nom basseĭne maloĭ glubiny,** [Stationary wind and circulation in a rectangular basin of slight depth], p. 1139–1144

Belousov, S. L.: **Ob otsenke oshibok approksimatsii pri reshenii uravneniia perenosa vikhria metodom posledovatel'nykh priblizheniĭ,** [Evaluation of the errors of approximation in the solution of the equation of eddy transport by the successive approximation method], p. 1145–1150

[Obituary of Harald Ulrik Sverdrup], p. 1151–1152

No. 10, Oct. 1958

Bukhnikashvili, A. V.: **Dvadtsatipiatiletie instituta geofiziki akademii nauk Gruzinskoĭ SSR,** [Twenty-fifth anniversary of the Geophysical Institute of the Academy of Sciences of the Georgian SSR], p. 1153–1161

Kosminskaia, I. P.; Mikhota, G. G. and Tulina, Iu. V.: **Stroenie zemnoĭ kory v Pamiro-Alaĭskoĭ zone po dannym glubinnogo seĭsmicheskogo zondirovaniia,** [The structure of the earth's crust in the Pamirs-Alai zone according to seismic depth soundings], p. 1162–1180

Davydova, N. I.: **O zavisimosti dinamicheskikh kharakteristik prodol'nykh golovnykh voln, sviazannykh s tonkimi sloiami, ot skorostnoĭ differentsiatsii sred,** [Dependence of the dynamic characteristics of longitudinal head waves, related to thin layers, on the differential velocity of the media], p. 1181–1191

Gel'bukh, L. A.: **Raschet ustanovivshegosia polia vyzvannoĭ poliarizatsii tel, imeiushchikh formu vytianutogo i szhatogo sferoidov,** [Calculation of the steady field of induced polarization of bodies having the shape of an extended and of a compressed spheroid], p. 1192–1201

Khvan, A. P.: **Pole vetrovykh voln na melkovodnom ozere,** [Field of wind waves in a shallow lake], p. 1202–1210

Levin, L. M.: **O funktsiiakh raspredeleniia oblachnykh kapel' po razmeram. Opticheskaia plotnost' oblaka,** [Functions of cloud droplet size distribution. Optical density of a cloud], p. 1211–1221

Feĭgel'son, E. M.: **Ob interpretatsii nabliudeniĭ iarkosti neba,** [The interpretation of observations on the brightness of the sky], p. 1222–1233

Isaev, V. S.: **K teorii napravlennogo deĭstviia gruppy seĭsmografov v sluchae impul'snykh kolebaniĭ, II,** [Theory of the oriented action of a group of seismographs in the case of impulse oscillations, Pt. 2], p. 1234–1245

Orlov, V. P.: **Magnitnye anomalii vekovogo khoda v Sredneĭ Azii,** [Secular trend of magnetic anomalies in Central Asia], p. 1245–1247

Dimitrov, L. V.: **Sposob uskorennoĭ obrabotki nabliudeniĭ s gravimetrami SN-3 i Norgarda,** [A method of accelerated analysis of observations with the SN-3 and Norgard gravimeters], p. 1248–1249

Monin, A. S.: **O predvychislenii kharakteristik zonal'noĭ tsirkuliatsii atmosfery,** [Precalculation of the characteristics of zonal atmospheric circulation], p. 1250–1253

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PERIODICALS IN WHICH METEOROLOGICAL ARTICLES REGULARLY APPEAR

★**Acta Geophysica Polonica,** [Warsaw].
Akademiia Nauk SSSR, Izvestiia, Ser. Geogr. and **Ser. Geofiz.,** [Moscow].
American Geophysical Union, Transactions, [Washington].
★**American Meteorological Society, Bulletin,** [Boston].
★**Angewandte Meteorologie,** [Potsdam].
Annales de Géophysique, Centre National de la Recherche Scientifique, [Paris].
★**Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A and Ser. B,** [Vienna].
Australian Journal of Physics, [Melbourne].
★**Australian Meteorological Magazine,** [Melbourne].
★**Ciel et Terre,** Société Belge d'Astronomie, Météorologie et Physique du Globe, [Brussels].
★**Geofisica e Meteorologia,** Società Italiana di Geofisica, [Genoa].
Geofisica Pura e Applicata, Istituto Geofisico Italiano, [Milan].
★**Geophysical Magazine,** Japan Meteorological Agency, [Tokyo].
Hemel en Dampkring, [The Hague].
★**Időjárás,** Magyar Meteorológiai Társaság and Országos Meteorológiai Intézet, [Budapest]
★**Indian Journal of Meteorology and Geophysics,** [Delhi].
★**Journal of Atmospheric and Terrestrial Physics,** [London].
Journal of Geophysical Research, [Washington].
★**Journal of Meteorological Research,** [Tokyo].
★**Journal of Meteorology,** American Meteorological Society, [Boston].
★**Journal Scientifique de la Météorologie,** Société Météorologique de France, [Paris].
★**The Marine Observer,** Air Ministry, Meteorological Office, London.
★**The Meteorological Magazine,** Air Ministry, Meteorological Office, London.
★**Meteorologické Zprávy** [Prague].
★**Meteorological Society of Japan, Journal,** [Tokyo].
★**La Météorologie,** Société Météorologique de France, [Paris].
★**Meteorologiia i Gidrologiia,** [Leningrad].
★**Meteorologische Rundschau,** [Berlin].
★**Monthly Weather Review,** U. S. Weather Bureau, Washington, D. C.
Polarforschung, Archiv für Polarforschung, [Kiel].
★**Przegląd Geofizyczny,** [Warsaw].
Revista de Geofísica, Instituto Nacional de Geofisica, [Madrid].
★**Rivista di Meteorologia Aeronautica,** Servizio Meteorologico, [Rome].
★**Royal Meteorological Society, Quarterly Journal,** [London].
★**South Africa, Weather Bureau, Notos,** [Pretoria].
★**Tellus,** Svenska Geofysiska Föreningen, Stockholm.
Vsesoiuznoe Geograficheskoe Obshchestvo, SSSR, Izvestiia, [Leningrad].
★**Weather,** Royal Meteorological Society, [London].
★**Weatherwise,** American Meteorological Society, [Boston].
★**Wetter und Leben,** Österreichische Gesellschaft für Meteorologie, [Vienna].
★**WMO Bulletin,** World Meteorological Organization, [Geneva].
★**Zeitschrift für Meteorologie,** Meteorologisches Observatorium, Potsdam.

★ Indicates those periodicals which are primarily meteorological.

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